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Vol. XIV, No. 4 APRIL, 1925

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

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THE SEVENTY-THIRD ANNUAL CONVENTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN DES MOINES, IA., DURING THE WEEK OF AUGUST 24, 1925.

The 1925 Meetings of the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will also be held in Des Moines, during the week of August 24, 1925.

For Association Roster, see pages x, xii and xiv.

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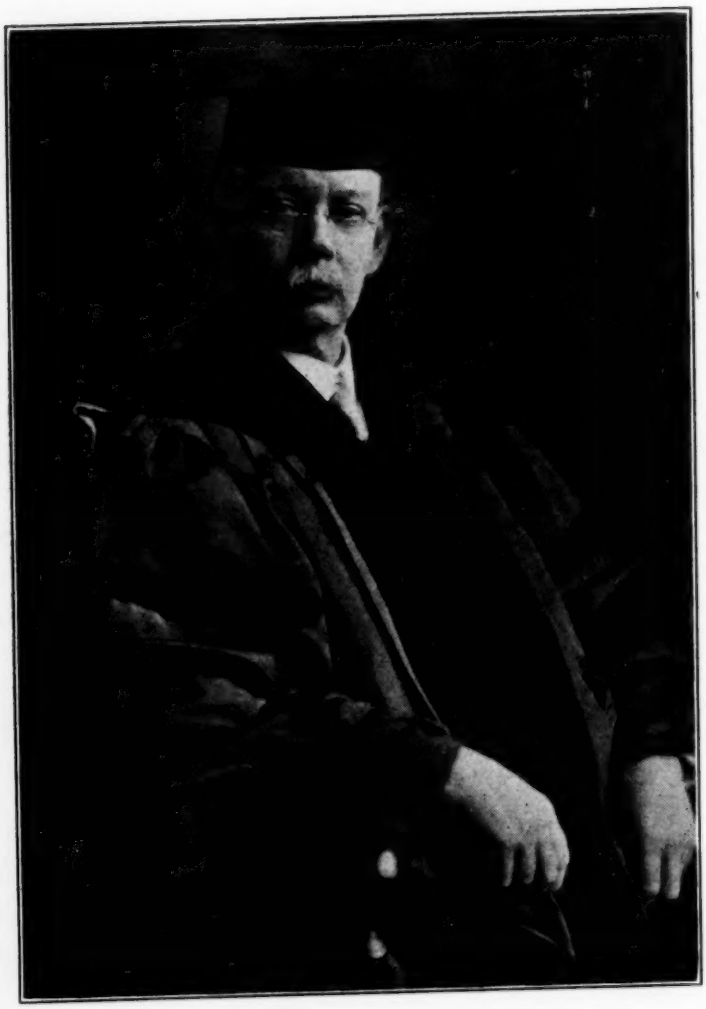

WILBUR L. SCOVILLE.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XIV APRIL, 1925 No. 4

WILBUR LINCOLN SCOVILLE.

Teacher, editor, author, association worker, revision committee chairman—these are a few of the widely-diversified activities in which Wilbur Lincoln Scoville has gained distinction. But these fields, important though they are, do not represent Mr. Scoville's greatest achievements; it is as a pharmaceutical chemist that he has contributed most markedly.

Few other men, perhaps, have taken a greater interest in the problems of pure pharmacy or have done more to solve them.

His pharmaceutical career started about forty-five years ago in a drug store in Bridgeport, Connecticut, the city of his birth. In 1889, the year of his graduation from the Massachusetts College of Pharmacy, he was appointed chemist for the E. L. Patch Company and carried on this work in addition to serving as an instructor in pharmacy at his *alma mater*. It was during this period, in 1891 to be exact, that he joined the AMERICAN PHARMACEUTICAL ASSOCIATION, of which he is now a life member.

In 1892 Mr. Scoville resigned his duties with the Patch Company in order to devote more time to the position of professor of practical pharmacy at the Massachusetts College, a chair which he occupied with distinction until 1904.

A versatile writer on pharmaceutical topics, Mr. Scoville found time during his teaching career to serve first as pharmaceutical editor of the *New England Druggist* and later of the *Spatula*. Also, for two years, he was editor of the *Alumni Journal* of the Massachusetts College of Pharmacy. He was President of the alumni association in 1892 and its Secretary for the next nine years.

Commercial work beckoned in 1904 and Mr. Scoville gave up teaching to again become a pharmaceutical chemist in the industries, this time for the Jaynes stores of Boston, which later became the Riker-Hegeman Stores and are now part of the Liggett group.

In 1907 came an opportunity to join the scientific staff of Parke, Davis & Company, Detroit. This connection still holds, Mr. Scoville's title being that of chief of the analytical department.

As an author, Mr. Scoville's best-known work is his "Art of Compounding," a practical book that is now in its fourth edition and that is used as a text or reference by a majority of the colleges of the country. His other writings have been numerous and constructive, one of them, "The Influence of Acid in the Extraction of Cinchona," winning for him the Ebert Prize in 1921. His published papers, too, were instrumental in gaining for him, in 1922, the honorary degree of Master in Pharmacy from the Philadelphia College of Pharmacy.

Mr. Scoville has been a regular attendant of A. PH. A. conventions for more than a quarter of a century and many of his most valuable papers have been presented at annual meetings. Especially has he been prominent in the deliberations of the practical pharmacy and scientific sections. He served as chairman of the latter section in 1915–16.

His most signal contributions to the calling, however, have been in connection with the work of U. S. P. and N. F. revisions. When, in 1915, ill health forced C. Lewis Diehl to relinquish the active chairmanship of the National Formulary revision committee, Mr. Scoville was entrusted with the difficult proposition of bringing the fourth revision to completion. He accomplished the task in a praiseworthy manner, and, when the fifth revision was started, Mr. Scoville was elected as chairman. The work of revision, which has been going on for the past several years, is now nearing completion. Mr. Scoville has also been a member of the last two U. S. P. revision committees and is vice-chairman of the present committee. Because of the demands on his time by revision work, Mr. Scoville felt obliged to decline the nomination as candidate for President of the AMERICAN PHARMACEUTICAL ASSOCIATION tendered him at the Buffalo meeting.

Mr. Scoville is married and his wife is a frequent attendant at the Association meetings.

WALTER M. CHASE.

ATTORNEY GENERAL STONE ON RESALE PRICE MAINTENANCE.

Attorney General Harlan F. Stone, who has just been elevated to the United States Supreme Court, addressed a communication to the Federal Trade Commission regarding the Commission's investigation of the Aluminum Company of America. While there were many phases of the Aluminum Company's activities that were commented upon in the Attorney General's communication, there is one paragraph which is of great interest to independent manufacturers who desire to adopt resale price maintenance policies which do not involve unlawful conspiracies, contracts or coöperative methods with dealers. This quotation is as follows:

With respect to resale prices there is not shown any concert of action between the different manufacturers upon this point. Each had his own prices for his cleaners, which were not uniform as between manufacturers, and each tried to have his fixed prices maintained by his dealers, and this fact alone would not violate the Sherman Act.

The reference is to the activities of the Vacuum Cleaners Manufacturers' Association.

This clear-cut statement from the Attorney General seems to definitely establish the policy of the Department of Justice with respect to manufacturers who wish to use their independent discretion in the selection of their customers on a resale price maintenance basis, when such selection is made by the manufacturer acting independently and in his own interest.—*N. W. D. A. Bulletin, No. 95.*

THE HISTORICAL DEVELOPMENT OF SURGICAL ANESTHESIA.

An interesting and informative article, under above caption, was contributed by Prof. Chauncey D. Leake of the University of Wisconsin and is published in *The Scientific Monthly* for March. Crawford W. Long, physician-pharmacist, is given rightful recognition by Dr. Leake. Names well known to pharmacists occur throughout this valuable contribution.

EDITORIAL

E. G. EBERLE, EDITOR 253 Bourse Bldg., PHILADELPHIA

THE "RECIPE BOOK."

GRAY'S immortal elegy was not written in a brief afternoon when the Muse was unduly profuse and prolific. It required many, many, years so the author claimed, to shape this magnificent composition, in which each word bears marks of careful chiselling to fit it to its proper vantage place.

And though perchance the comparison is both odious and odd, that peer of pharmacopœias, our own, is also a much delayed distillate. To afford its quality, its usefulness, its dependability, Time, the gracious ally of the framers and revisers of that ponderous tome, hovers slowly over its composition.

So also with the Recipe Book. Since Hynson's suggestion gave birth to this undertaking, many years have slipped away. During that time many hands and heads have contributed to the furtherance of the project. Yet the book is still unfinished, and there is even now no immediate danger of its being too rapidly completed.

However, if the passage of time, as recorded above, grants to this book, as it seemingly does to the Pharmacopœia, quality, usefulness and dependability, then the dilatoriness of its compilers has a strategic basis. But the mere passage of time does not beget accomplishment. There must be action within the time, and it is believed that members of the Association who look forward to the publication of this book can now be reassured of the fact that the work is progressing, and that its appearance will not be too long delayed.

The admirable work of the successive chairmen of the committee in collecting and in testing formulas, has required a great deal of effort and time. Their compilation is now being condensed, assembled and arranged for final adjudication by the Committee on Scope, and it is hoped that the work will be expeditiously brought to such a state that the Committee on Publications of the Association will have the completed manuscript in hand before another year has passed.

It is believed, when the book is finally published, that it will be useful, comprehensive, up-to-date and reliable, well worthy of the Association that sponsors it. That indeed, is the only kind of a Formula Book that the AMERICAN PHARMACEUTICAL ASSOCIATION can afford to sponsor. IVOR GRIFFITH.

WHAT UNITED AMERICAN PHARMACY MEANS.

CHAIRMAN H. A. B. Dunning has sent out an appeal to pharmacists to join hands in support of the American Pharmacy Headquarters Project on April 17. Whether the latter day will have passed before the JOURNAL reaches the members or not, the call is applicable to other days when pharmacists in some localities can join in concerted effort to augment the Headquarters' Fund. It was deemed advisable to change the Campaign Day from April 10th to 17th. This accounts for the date given in the slogan of the March issue and the effort to have the April JOURNAL mailed in advance of the usual mailing day, which may, however, not be possible.

The idea of selecting a day on which special effort is directed to complete the fund is a good one. There is strength in united action; there are days which pharmacists devote to the support of worthy causes, and this is one in their own interest and pharmacy in general which will speak for united pharmacy. Really, there should be an annual pharmacy week, when the public is made aware of the services of pharmacy, and one or more of the days should be given to the Headquarters' Project for, after all, a calling is valued by the general public at the estimate of its own members. Pharmacy should have due consideration during every day of the year; "if the public knows that the calling is held in high esteem by its members, that they are ready to make sacrifices for it; if the public has tangible evidence of the quality of the calling through knowledge of the achievements of its members; if the public sees 'outward visible signs' of the value of the calling; then and only then will the public say, 'this is truly of great service.'"

The message of Chairman H. A. B. Dunning follows:

"Every drug man in the country is now interested in the Great Central Headquarters Building to be established for American Pharmacy. All know that the future of every branch of the industry demands such an institution. All know that the power and influence of American Pharmacy will never make itself felt until we begin to work together. All know that this great project has the unanimous endorsement of the drug industry, and that the benefits to be derived from the operation of the building will increase rapidly as the years go by.

"The Campaign Committee in less than one year has accomplished what many held to be an impossibility. It has produced a united sentiment for wholehearted coöperative effort in pharmacy. It has effectively paved the way for American Pharmacy to obtain the recognition and standing to which it is entitled. It has, through its work, gained more favorable comment for pharmacy than has ever before been obtained. It has secured not only the active support of all branches of the drug industry, but in addition, subscriptions totaling half of the amount necessary to establish a great Headquarters Building.

"American Pharmacy is now ready to complete this great project. The Campaign Committee has designated April 17 as All-Pharmacy Campaign Day. Every druggist in the United States is now requested to give of his time and energy on April 17 to the work of completing this fund. Retailers, wholesalers, manufacturers, teachers, and students—all are vitally concerned, all are now urged to help. The national and state associations, boards of pharmacy, colleges of pharmacy, and hundreds of local associations have all endorsed the project and all are urged to give active support on April 17.

"Six thousand five hundred pharmacists were especially requested by letter to give service on April 17. These men represent all branches of the drug industry. About half of them are members of the AMERICAN PHARMACEUTICAL ASSOCIATION, under whose auspices this great work for the benefit of all pharmacy is being done. These men have pledged themselves to give full service, and Prof. E. L. Newcomb, University of Minnesota, Minneapolis, Minn., is now sending them supplies and giving the necessary coöperation.

"Thousands of other pharmacists are needed to complete this great work on April 17. Every one who is interested in the welfare and progress of pharmacy and willing to help *is urged* to communicate with Publicity Director Newcomb at

once. He will supply all who coöperate with cards and a small folder, giving special information which will enable the solicitor to properly inform the prospective subscriber.

"Now is the time to act! Collectively and individually, we should now, all of us associated in any way with pharmacy, do our duty on April 17 and complete this great fund.

"Surely there are few of us, we the druggists of the United States, who cannot willingly give, at least, one day's time, April 17, to this work, which is of such vital importance to pharmacy and to ourselves."

PUBLICITY FOR PHARMACY.

Abstracts of the bulletins of the Drug Trade Bureau of Public Information are printed in this issue and, in these columns, on a number of occasions, the splendid work of this Bureau has received favorable comment. In this number attention is specifically called to the posters being arranged and distributed through the AMERICAN PHARMACEUTICAL ASSOCIATION. The first of these speaks of some of the services rendered by pharmacy in the cause of public health and how the new research institute for pharmacy in the American Pharmacy Headquarters will benefit the public. The posters can be obtained from Publicity Director E. L. Newcomb. The messages will inform the public relative to the service of pharmacy; therefore, every pharmacist should become a distributor of them—it represents publicity of progressive value.

Dr. Otto Neustatter, director of the Society for Promoting Health Education, of Munich, has been in this country for two months investigating health education in the United States. Before leaving he said,—"I am taking a collection of health posters to exhibit in Germany. I am particularly impressed by the visual appeal these posters make. The physicians in this country have seen that they must participate in the movement for popular health education, and that they cannot remain aloof. I have obtained many ideas to report to my organization."

Pharmacy needs to encourage the publicity campaign and, more effectively, bring its message to the public; pharmacists now have the opportunity and other professions are wondering why their great interest is not greater and their evident enthusiasm not more pronounced.

Let us do our part in acquainting the public with the service of pharmacy, share in public health promotion, evidence our belief in pharmacy and its mission.

E. G. E.

Have you done your part toward making the American Pharmacy Headquarters an accomplishment? It will be an "outward visible sign" of the values we place on our service to humanity.

THE ELECTROMETRIC TITRATION OF ALKALOIDS: APPLICATION OF THE QUINHYDRONE ELECTRODE TO ALKALOIDAL TITRATIONS.*

BY LEONARD R. WAGENER AND WILLIAM J. MCGILL.

INTRODUCTION.

Einar Biilmann and others[1] have shown that by means of quinhydrone, which is a combination of one molecule of hydroquinone and one molecule of quinone, an electrode may be prepared which in many cases can be used as a very good hydrogen electrode. Such an electrode gives a hydrogen pressure which is exceedingly feeble, but in the case of a dilute electrolyte, constant and well-defined at a given temperature. The hydrogen pressure results from the transformation of dissolved hydroquinone to dissolved quinone and hydrogen, and *vice versa*. The chemical reaction involved is:

$$\underset{\text{quinone}}{C_6H_4O_2} + H_2 \rightleftarrows \underset{\text{hydroquinone}}{C_6H_4O_2H_2}$$

According to the law of mass action,

$$[H_2] = k \cdot \frac{[C_6H_4OH]}{[C_6H_4O_2]}$$

i. e., at a particular temperature the hydrogen concentration in the quinone-hydroquinone electrode is exclusively dependent on the ratio between the concentration of hydroquinone and quinone.

Biilmann determined the E. M. F. of such an electrode by measurement of a series of cells of the type

$$\text{Pt/quinhydrone, } a\text{-}nH+/\text{-}anH + H_2 \text{ 1 atm./pt.}$$

where *a-nH* represents an *a*-normal, dilute acid electrolyte, whose molar concentration does not exceed 0.1; this was found to be 0.7044–18°, 0.699–25°. The platinum immersed in the quinhydrone solution is positive to the platinum of the hydrogen electrode.

In the quinhydrone electrode, one does not use a mixture of hydroquinone and quinone, but the compound quinhydrone, which in aqueous solution dissociates almost completely into equal molecules of its components.

Quinhydrone is easily prepared according to the directions of Biilmann. To a solution of 25 Gms. of hydroquinone in 100 cc. of water (may need warming) one adds 300 cc. of a warm solution (about 65°) of 100 Gms. ferriammonium sulphate. The quinhydrone comes down in very find needles. Cool the mixture in ice, filter with suction, and wash three or four times with cold water. A yield of about 15 Gms. is obtained.

PURPOSE OF INVESTIGATION.

A great number of indicators have been comparatively recently placed at the disposal of the analyst as a result of the work of Soerensen, Clark and others.

* The expenses of this investigation have been supported in part by a grant from the Research Fund of the AMERICAN PHARMACEUTICAL ASSOCIATION.

[1] "Trans. of the Faraday Society," 19 (1924), No. 57, 676.

During the past three years, workers in this laboratory have been endeavoring to select from these, that particular indicator best suited for use in the acidimetric determination of each of the alkaloids.[1,2,3]

The only rational method for such selections would seem to be actual electrometric measurements of the p_H value of solutions of the alkaloidal salts, and a subsequent choice of the indicator upon this basis.

A natural development of this work was the application of electrometric titrations to the alkaloidal determination of residues in actual crude drug assays. All electrometric determinations had been made with the hydrogen electrode *versus* a ($N/1$ KCl) calomel electrode.

It was found that in these electrometric titrations, equilibrium was not rapidly obtained, thereby consuming much time between readings. This time element also increased the danger of reduction of the alkaloid by the hydrogen in the presence of the platinum black electrode. Biilmann's work[4] suggested the use of quinhydrone. We found that the quinhydrone electrode can be quickly prepared and that equilibrium is obtained in a very short time. The danger of reduction is greatly lessened.

We accordingly have determined the p_H value of solutions of morphine, atropine and strychnine salts, using the quinhydrone electrode and have also attempted to apply it to actual electrometric titrations of these alkaloids. The following formula was used in all p_H determinations:

$$p_H = \frac{4148 - \text{E. M. F.}}{0.0577} \text{ at } 25°$$

EXPERIMENTAL DATA.

The p_H values were first determined of solutions of 0.4740 Gm. of morphine sulphate dissolved in 30 cc. and 240 cc. respectively of boiled distilled water, plus a pinch of quinhydrone. The measured potential difference, by which the p_H value was obtained was made by connecting a quinhydrone electrode through a saturated KCl salt bridge to a standard mercury calomel $N/1$ KCl combination, the calomel electrode being negative to the quinhydrone electrode. The p_H value was next determined on 0.4740 Gm. of morphine sulphate in the presence of 0.05325 Gm. of anhydrous sodium sulphate, again using 30 cc. and 240 cc. respectively of boiled distilled water plus a pinch of quinhydrone. The effect was also tried on 0.438 Gm. of sodium chloride with the same dilutions of morphine sulphate. Approximately the amounts of morphine sulphate and the salts were used which one would find at the end-point in a routine titration of the alkaloidal residue from an opium sample. In the U. S. P. assay, 20 cc. of $N/10$ H_2SO_4 are used, which represents an excess in titrating 4 Gms. of opium. In using 0.4740 Gm. of morphine (0.35645 Gm. of anhydrous morphine) 12.5 cc. of $N/10$ H_2SO_4 are taken up, an excess of 7.5 of $N/10$ H_2SO_4 remains to be neutralized with $N/10$ NaOH.

At the neutral point then, there would be in the titrating flask, providing the sample of opium contained 0.35645 Gm. of anhydrous morphine, the following:

---

[1] JOUR. A. PH. A., 11 (1922), No. 12.
[2] *J. Am. Chem. Soc.*, 44 (1922), No. 10.
[3] JOUR. A. PH. A., 12 (1923), No. 10.
[4] "Trans. of the Faraday Society," 19 (1924), No. 57, 676.

0.4740 Gm. of morphine sulphate, 0.05325 Gm. of sodium sulphate, or if $N/10$ HCl were used, 0.438 Gm. of sodium chloride, in place of the sodium sulphate.

The object of the determination of the p_H value in the presence of salts was to note the effect, if any, of these salts which are normally formed in the indirect titration of alkaloidal residues in the assay of opium.

A number of determinations were made, the results as indicated below being typical. Recrystallized morphine sulphate and boiled distilled water were used in each experiment.

TABLE I.

Morphine sulphate Gm.	Sodium sulphate Gm.	Sodium chloride.	Amount of solvent.	p_H values.
0.4740	0.05325	.....	30 cc.	5.287
0.4740	0.05325	.....	240 cc.	5.748
0.4740	.....	0.0435	30 cc.	5.27
0.4740	.....	0.0435	240 cc.	5.69
0.4740	.....	.....	30 cc.	5.26
0.4740	.....	.....	240 cc.	5.64

The influence of salt upon the p_H seemingly is negligible. The effect of increasing amounts of sodium sulphate added to a definite volume of $N/20$ morphine sulphate containing small amount of quinhydrone was determined. A normal KCl calomel electrode was used as the other cell.

TABLE II.

$N/20$ morphine sulphate.	Quinhydrone *versus* calomel.	p_H values.	Sodium sulphate Gm.
.....	.....	4.66	0
.....	.....	4.70	0.001
.....	.....	4.78	0.005
.....	.....	4.82	0.008
.....	.....	4.87	0.015
.....	.....	4.92	0.025
.....	.....	5.01	0.040
.....	.....	5.1	1.

It has been found that with increased concentration of salts the potential decreases. This is due, perhaps to the influence of the salts on the solubility of hydroquinone and quinone which it decreases, but not in the same degree. The quinhydrone electrode in a solution rich in salt is more negative than that of a quinhydrone in a solution with lower salt concentration. It must be noted here that the p_H change is not great, and also that but 30 cc. of solution was used whereas in an actual titration 250 cc. of solution was used.

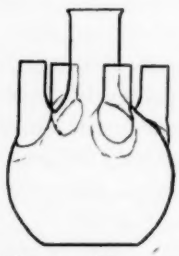

Fig. 1.—Titrating flask.

In carrying out alkaloidal titrations with the quinhydrone electrode we used a 500-cc. round bottom flask (Fig. 1) having four openings in the top, one for each of the following: stirring rod, blank platinum foil, burette containing the $N/10$ sodium hydroxide and the comparison electrode side arm. In this round bottom flask were placed a known amount of anhydrous morphine, a calculated amount of $N/10$ sulphuric acid, and a pinch of quinhydrone and this mixture diluted to 250 cc.

Our comparison electrode (Fig. 2) contains a solution of morphine sulphate, sodium sulphate and a small amount of quinhydrone of the same strength that theoretically will be present at the neutral point in the titrating flask (Fig. 1). This cell necessarily also has a blank platinum foil with attachments for connecting the comparison cell to the potentiometer, then to galvanometer and back to the titrating flask, thereby completing the circuit for our titrating experiments. The solution in the comparison cell was prepared as indicated because at the neutral point (zero reading on galvanometer) after adding sufficient $N/10$ NaOH, the solution which we are titrating should be identical with the solution in comparator (no potential difference) and from the amount of $N/10$ sodium hydroxide added to our titrating flask, the amount of morphine present in the solution can be determined in the usual way. It is not necessary in the experiment to use a potentiometer unless one wishes to show results by plotting the changes in E. M. F. against the amounts of standard alkali added. Equally as accurate results can be obtained more rapidly by attaching both comparator and round bottom flask to galvanometer through electrodes, bridging the two cells by placing the tip of the comparator cell in the solution in the titration flask (Fig. 3) and adding $N/10$ NaOH until a zero reading is obtained on galvanometer (no deflection). This is the neutral point indicating that both solutions are alike. A number of determinations were made. We give the results of three which are typical of the majority.

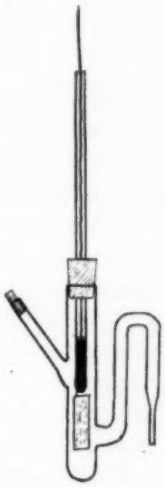

Fig. 2.—Comparison electrode.

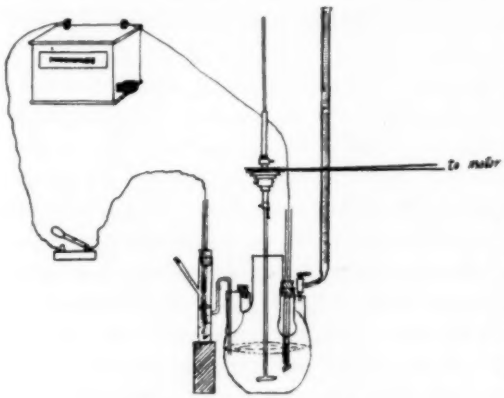

Fig. 3.—Titration flask.

CONTENTS OF TITRATION FLASK AT BEGINNING OF TITRATION.

Morphine, anhydrous	0.1723 Gm.
Sulphuric acid $N/10$	10 cc.
Quinhydrone	minute amount
Water, boiled distilled q. s.	250 cc.

CONTENTS OF COMPARISON FLASK.

Morphine Sulphate	1.2291 Gm.
Sodium Sulphate, anhydrous	0.284 Gm.
Quinhydrone	minute amount
Water, boiled distilled q. s.	250 cc.

$N/10$ NaOH added to titrating flask, to zero galvanometer reading or neutral point.

RESULTS.

TABLE III.

	Gm. anhydrous morphine. Present.	Found.
Sample 1	0.1723	0.1729
Sample 2	0.2010	0.1970
Sample 3	0.1715	0.16944

Using methyl red as an indicator, No. 3 result gave 0.17145 Gm. morphine present. We were unable to obtain an end-point with brom phenol blue.

We determined the p_H value of $N/100$ strychnine sulphate, also $N/200$ strychnine sulphate, using as a comparison a $N/1$ potassium chloride calomel cell, each solution containing quinhydrone.

TABLE IV.

		p_H.
$N/100$ Strychnine Sulphate	Q/cal.	4.887
$N/200$ Strychnine Sulphate	Q/cal.	5.380

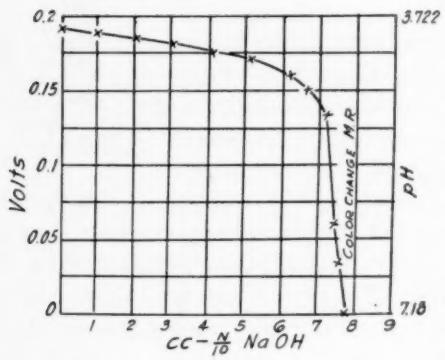

Fig. 4.

A definite amount of strychnine, recrystallized and dried to constant weight was treated with an excess of $N/10$ sulphuric acid and titrated with $N/10$ sodium hydroxide. The set up used in the morphine determination was employed, the end-point being the zero reading on the galvanometer. As a check, we used methyl red for our colorimetric determination. The strychnine titrating curve in Fig. 4 shows the relation of voltage to cc. of $N/10$ NaOH added. The p_H values at beginning and at the end of titration are also indicated.

VALUES.

Strychnine.

Present	0.4177 Gm.
Found	0.4161 Gm.

The p_H values of solutions of atropine sulphate were determined using the quinhydrone electrode *versus* the calomel electrode.

TABLE V.

COMMERCIAL SAMPLE—BOILED DISTILLED WATER.

Sample.	Strength.	Voltage.	p_H values.
No. 1	1%	0.07565	5.877
No. 2	1%	0.0752	5.885
No. 3	1%	0.0907	5.61

TABLE VI.

ATROPINE SULPHATE RECRYSTALLIZED THREE TIMES.

Sample.	Strength.	Voltage.	p_H values.
No. 1	1%	0.1727	4.19
No. 2	1%	0.1811	4.03

Titrations of atropine were also carried out using the same set up as in the morphine determination.

TABLE VII.

Sample.	Present.	Found.
No. 1	0.1446	0.14517
No. 2	0.1446	0.14259
No. 3	0.1446	0.1424

DISCUSSION OF RESULTS.

In the majority of cases, results were obtained which were slightly lower than the theoretical values. In the determinations where methyl red was also added to the solution, the end-point as indicated by the color change invariably was reached before the electrometric end-point, the colorimetric results consequently being higher and nearer the theoretical values. Although the alkaloids used in all of the titration experiments had been recrystallized several times, and then dried to constant weight at temperatures insuring the absence of decomposition, it is not possible to say that these samples were 100% pure. Since the purity of an alkaloid is ordinarily determined by acidimetric titration, the accuracy of which is questionable, we have no absolute criterion for the purity of our samples. It is therefore, not permissible to assume that the results obtained by the use of the quinhydrone electrode, are either more or less nearly correct values than those obtained colorimetrically. The results obtained with the quinhydrone electrode are reproducible, however, and it remains for further investigation to discover whether the electrometric or the colorimetric method of titration gives the more nearly correct result.

SUMMARY.

The application of the quinhydrone electrode to the titration of alkaloids has been described.

It has been shown that electrometric titrations carried out with the quinhydrone electrode, using a comparator electrode set up, give results which are consistent, but invariably slightly lower than those given by the calorimetric method.

ACKNOWLEDGMENTS.

The completion of the experimental work in this paper was made possible by a grant from the Research Fund of the AMERICAN PHARMACEUTICAL ASSOCIATION.

We wish to thank Mr. J. Lester Hayman of this department for the drawings in this paper.

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THE USE OF THE POTENTIOMETER IN THE QUANTITATIVE ANALYSIS OF ALKALOIDAL SOLUTIONS.*

BY JOHN C. KRANTZ, JR.

INTRODUCTION.

There is no instrument which, in recent years, has helped the scientist in the study of chemical phenomena more than the potentiometer. The pharmacist has not been slow to recognize the possibilities of the use of this instrument in solving many of the pharmaceutical problems which have confronted the manufacturer, retailer and drug analyst. Thus Masucci and Moffat[1] have very comprehensively shown how easily the actual acidity of medicinal solutions may be determined by this instrument in conjunction with the other apparatus necessary for its proper use. Smith and Giesy[2] have employed the potentiometer in the determination of the alkalinity of Magma Magnesiæ. McGill[3] and his associates have begun a pioneer phase of research in employing electrical instruments to evaluate the alkaloidal value of crude drugs.

In this work McGill has determined the voltage end-point for several alkaloidal residues and consequently he has been able to employ the potentiometer as an indicator in the residual titration of the excess of acid. After carefully reviewing this important investigation, it occurred to the writer that, based upon definite physical chemical principles, a method of analysis might be devised, in which the potentiometer would not only replace a chemical indicator but, at the same time, take the place of the alkali solution.

THEORETICAL CONSIDERATIONS.

McGill pointed out, in his experiments with Cinchona residues, that the concentration of the alkaloidal salts has very little effect upon the hydrogen-ion concentration of the solution. This fact was verified by the author as can be observed from the results tabulated in this paper. Based upon this fact—if the molarity of the alkaloidal salt solution does not influence the p_H of the solution, a definite excess of acid added to variable amounts of alkaloidal salts and made up to a definite volume, at which the ionization of the acid is practically complete, will yield solutions with a p_H which is a function of the excess of acid present. The

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* Scientific Section A. PH. A., Buffalo meeting, 1924.

[1] JOUR. A. PH. A., 12, 609 (1923).

[2] *Ibid.*, 12, 955 (1923).

[3] *Ibid.*, 11, 1003 (1922).

hydrogen-ion concentration produced by the alkaloidal salt can be subtracted from the hydrogen-ion concentration of the solution, and the difference can then be calculated as excess of tenth normal acid. This would of course involve several calculations and present practical difficulties which are not apparent when considered from the standpoint of theory alone. Thus, in order to obviate lengthy calculations and any difficulties that might arise from the buffer action of the alkaloidal salt, a quantity of alkaloid was dissolved in just enough tenth normal hydrochloric acid to combine with it, and a curve was plotted using various amounts of $N/10$ hydrochloric acid in excess as abscissae and the p_H of the solutions as ordinates. If then in any alkaloidal salt solution in which the quantity of acid is known and a curve has been prepared, the p_H of the solution is estimated as

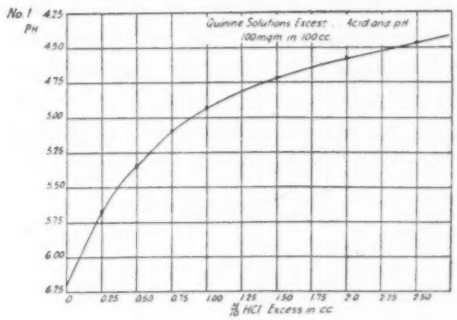

Fig. 1.

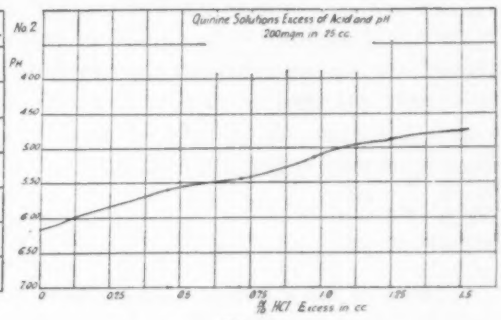

Fig. 2.

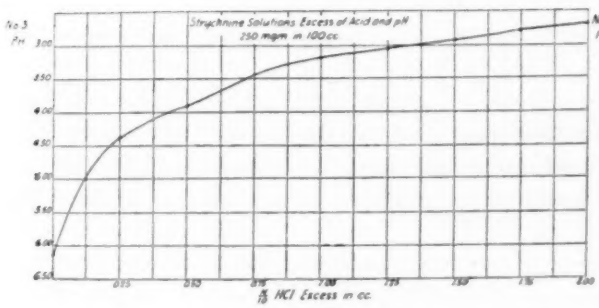

Fig. 3.

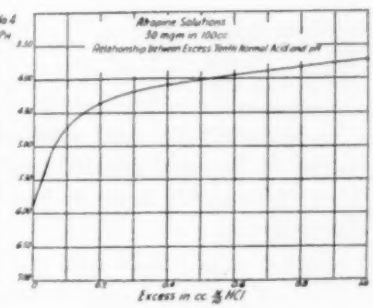

Fig. 4.

excess acid from the curve, and from these data—the variables, *i. e.*, the quantity of alkaloid present may be calculated in the usual manner.

METHODS EMPLOYED AND RESULTS.

Throughout this work a Leeds and Northrup hydrogen-ion outfit was employed with a Bailey electrode and normal calomel electrode.

A. Quinine.—Curve number one was prepared by dissolving 0.100 Gm. of quinine (equivalent in quantity to the amount of alkaloids obtained from 2 Gms. of cinchona) in a molecular equivalent quantity of $N/10$ hydrochloric acid and the solution was made up to 100 cc. with boiled distilled water. The p_H was determined immediately. A number of solutions were prepared in a similar manner keeping the amounts of quinine constant, but increasing the quantities of acid

as shown by the curve. After plotting the curve, the amount of quinine was varied and an excess of acid added comparable to that contained in solutions previously studied and the following results were obtained.

0.200 Gm. Quinine, 0.75 cc. $N/10$ HCl, p_H 5.09
0.100 Gm. Quinine, 0.75 cc. $N/10$ HCl, p_H 5.10
0.100 Gm. Quinine, 1.5 cc. $N/10$ HCl, p_H 4.72
0.120 Gm. Quinine, 1.5 cc. $N/10$ HCl, p_H 4.71
0.100 Gm. Quinine, no excess HCl, p_H 6.19
0.800 Gm. Quinine, no excess HCl, p_H 6.15

These results indicate that the amount of quinine present has little effect upon the p_H of the solution.

Several solutions of quinine alkaloid were prepared using 4.7 cc. $N/10$ hydrochloric acid and made up to 100 cc. with distilled water. After the determination of the p_H the solutions were analyzed by curve No. 1 and the following results were obtained.

	Grams of quinine in 100 cc.	p_H.	Grams found.
No. 1	0.120	4.71	0.1192
No. 2	0.140	5.02	0.1445
No. 3	0.160	5.42	0.1611
No. 4	0.170	5.77	0.1702

Some of the solutions used in the preliminary work with a much higher quinine content containing 9 cc. $N/10$ hydrochloric acid were analyzed by this curve and the following results obtained.

	Grams of quinine in 100 cc.	p_H.	Grams found.
No. 1	0.300	5.16	0.313
No. 2	0.290	4.74	0.286

Naturally the best plan to follow in analysis by this method is to have the curve to be used plotted with solutions containing an amount of the alkaloid that corresponds more or less closely to the amounts present in the solutions to be analyzed.

CURVE NO. 1.

Another curve was prepared using 25 cc. as the total volume and excess of acid up to 1.5 cc. Four quinine solutions were prepared in a similar way containing 7.05 cc. $N/10$ hydrochloric acid and analyzed by this curve, *i. e.*, No. 2. The following results were obtained.

	Grams of quinine in 25 cc.	p_H.	Grams found.
No. 1	0.210	4.74	0.2099
No. 2	0.220	4.94	0.2232
No. 3	0.230	5.20	0.2326
No. 4	0.240	5.46	0.2417

CURVE NO. 2. B. STRYCHNINE.

A third curve was prepared using 0.250 Gm. of strychnine and after the addition of the amounts of acid as indicated by the curve, the solution was made up to 100 cc. and its p_H determined. In a similar manner four solutions were pre-

pared containing different amounts of strychnine and 9.5 cc. of $N/10$ hydrochloric acid. These solutions were analyzed by curve No. 3 and the following results were obtained.

	Grams of strychnine in 100 cc.	p_H.	Grams found.
No. 1	0.305	3.92	0.3015
No. 2	0.290	3.23	0.2857
No. 3	0.275	2.98	0.2701
No. 4	0.260	2.74	0.2583

CURVE NO. 3. C. ATROPINE.

The fourth curve represents the p_H of Atropine solutions with different quantities of $N/10$ hydrochloric acid. Thirty milligrams of atropine was dissolved in a molecular equivalent of $N/10$ hydrochloric acid and the volume was made up to 100 cc. The other solutions containing atropine and hydrochloric acid were prepared in a similar manner and from the hydrogen ion concentrations of these solutions the atropine curve was plotted. Four solutions were prepared containing different amounts of atropine and 2 cc. of $N/10$ hydrochloric acid in 100 cc. These solutions were analyzed by curve No. 4 and the following results obtained.

	Grams of atropine in 100 cc.	p_H.	Grams found.
No. 1	0.035	3.84	0.0359
No. 2	0.040	3.92	0.0393
No. 3	0.045	4.04	0.0445
No. 4	0.050	4.38	0.0507

CURVE NO. 4.

The writer believes that the smoothness of the atropine curve and the more accurate results obtained in the analysis of this compound are due to the fact that the molar concentration of atropine in the solution was exceedingly small compared with that of the hydrochloric acid. Thus there is little possibility of ion repression or buffer action which may be caused by larger quantities of alkaloid.

D. CAFFEINE.

The difficulties presented in the analytical methods used to estimate caffeine volumetrically suggested the application of the potentiometer method to this substance. Accordingly nine solutions of caffeine were prepared containing in 100 cc. 0.100 Gm. of the anhydrous alkaloid. The first solution contained a molecular equivalent of hydrochloric acid or 5.15 cc. of the $N/10$ acid, and the other solutions contained 0.25 cc. $N/10$ hydrochloric acid additional in regular progression until in the ninth solution 2 cc. excess had been added.

The hydrogen ion concentration of the first solution was determined; this showed a p_H of 2.32, far too acidic for the plotting of a caffeine curve. An effort was made to plot milligrams of caffeine directly against p_H in very diluted acid solution; this, however, did not yield satisfactory results. The following data will demonstrate the difficulty involved in this project.

Five and fifteen hundredths cubic centimeters of $N/10$ hydrochloric acid diluted to 100 cc. is equivalent to a normality of 0.0052. At this dilution ionization is practically complete, so that

$$0.0052 \times 1.00 = 5.2 \times 10^{-3}\ (H^+)$$

By the potentiometer method this dilution of acid developed a voltage of 0.421 = 2.31 p_H.

$$\log \frac{1}{(H^+)} = 2.31$$

$$(H^+) = 4.9 \times 10^{-3}$$

The voltage developed by the solution containing the same amount of acid and 0.100 Gm. of caffeine was 0.425 = 2.32 p_H

$$\log \frac{1}{(H^+)} = 2.32$$

$$(H^+) = 4.8 \times 10^{-3}$$

This confirms mathematically the statement found frequently in the literature, that the hydrochloride of caffeine is easily decomposed by water. This experiment, although unsuccessful in obtaining a method of estimating caffeine by the potentiometer, shows that at this dilution the hydrolysis of the hydrochloride is practically complete.

CONCLUSIONS.

1. A method of analysis for certain alkaloids by means of the potentiometer has been devised which is rapid and simple in manipulation.

2. Curves which have been prepared for the analysis of alkaloids can be most accurately plotted by employing the minimum amount of alkaloid likely to be found in an unknown specimen and using a total volume of 100 cc.

3. The writer intends to attempt the analysis of colchicine by this method and also apply it to the analysis of crude drugs. The results of these investigations if successful will appear in a subsequent paper.

ABSTRACT OF DISCUSSION.

Chairman J. P. Snyder said that the work presented in this paper showed progress, and hoped that the electrometric method would be satisfactorily employed in alkaloidal determination.

Dr. I. M. Kolthoff did not think it would be possible to have accurate hydrogen electrode measurements of the hydrogen-ion concentration. He had endeavored to apply the method to alkaloidal solutions, but could not obtain very accurate measurements, because of the reduction of the alkaloid by the hydrogen, that is, accelerated by the presence of the platinum. He only succeeded in obtaining good results of the p_H of the solution by using the quinhydrone electrode; it is much easier to apply in these determinations.

The author replied to questions propounded that if the concentration of the alkaloid was quite dilute fairly good results were obtained. He did not think the work along the lines of this method had been perfected to the extent that it will be; he was able to get results comparable with the titration method. The touch electrode or drop electrode has been used at the University of Maryland—the electrode comes in contact with the alkaloidal solution only for a moment and the voltage is then read before there is any appreciable amount of reduction.

Dr. Kolthoff said that there can be no equilibrium when there is a reduction.

The author said the Department of Chemistry of the University of Maryland applies the method in the absorption of dyes and their hydrogen-ion concentration difficulties were overcome by using the touch electrode. The method has not been employed in alkaloidal de-

termination, but that would follow an observation as to whether resins and gums would poison the electrode or have any buffer action upon the solutions.

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PLANT COLORING MATTERS.

BY CHARLES E. SANDO.

Recently there appeared in THIS JOURNAL (1) an interesting contribution by Wurdack dealing principally with the distribution, general characteristics, and possible functions in plants of natural coloring matters. While the subject matter of this paper is still fresh in our minds, it seemed desirable to present at this time a number of additional facts of interest which relate to these coloring substances.

It is necessary to mention again only briefly a few salient points concerning the nature of the pigments themselves in view of the well-prepared résumé published. The brief references will be made solely to recall the compounds about which further discussion is to be had.

PLASTID PIGMENTS: CHLOROPHYLLS AND CAROTINOIDS.

That the chlorophyll molecule is exceedingly complex has already been indicated by Wurdack. Endeavors to isolate the pure pigment appeared for many years hopeless because of its instability, its chemical indifference, and on account of the many impurities which accompany it. A knowledge of its structure was finally gained when Willstätter and his collaborators deduced its constitution from a study of the decomposition products formed from it by hydrolysis with acids and alkalies. When the preparation of pure chlorophyll was ultimately accomplished in 1911, the facts learned from its analysis fully corroborated the former deductions as to its chemical makeup. As a result of the work on the decomposition products of chlorophyll, it became possible to compare the green pigment in over two hundred plants from numerous genera of cryptogams and phanerogams. This work demonstrated that leaf-green of all the plants examined consists of two components, chlorophyll *a* ($C_{55}H_{72}O_5N_4Mg$), a blue-black powder, and chlorophyll *b* ($C_{55}H_{70}O_6N_4Mg$), a dark green powder. It was also observed that with the exception of the *Phæophyceæ*, or brown algæ, all of the plants investigated contained approximately three molecules of chlorophyll *a* to one of chlorophyll *b*. In the case of the brown algæ, the green matter proved to be mostly chlorophyll *a* with but a small percentage of the other component.

It was early recognized that yellow substances accompany the green pigments in the plastid. This mutual occurrence of the coloring matters suggested a significant physiological rôle of the yellow pigments, consequently their separation became an important problem. Ultimately, it was shown that there are present in green leaves two easily crystallizable, nitrogen-free pigments. The members of this group, which are hydrocarbons or their derivatives, are designated carotinoids, but the exact nature of their basic structure or of their function is still unknown. The yellow pigment, carotin, is found not only accompanying chloro-

phyll in leaves but also in carrots (very little green pigment present), in nearly all yellow flowers and many fruits. Lycopin, an isomer of carotin, is the red pigment which occurs in the flesh of tomato and watermelon and in the skin of peppers. In the flesh of the tomato, which is an instance where carotin is not confined to the pastids, the coloring matter is distributed throughout the cells in the form of crystals or semi-crystalline granules. Other carotinoid pigments, for example, xanthophyll in leaves and carrots, and fucoxanthin in brown algæ, are oxides of carotin. These pigments as a group are very unstable and easily auto-oxidizable, therefore, in their preparation considerable care is necessary with regard to the temperature to which they are exposed and also in protecting them against the action of oxygen from the air.

SOLUBLE SAP PIGMENTS: FLAVONE AND ANTHOCYANIDIN DERIVATIVES.

In contrast to the chlorophylls and carotinoids, which are plastid coloring matters, derivatives of flavone and anthocyanidin pigments occur as soluble cell-sap substances. In all more than twenty different yellow flavones (and flavonols) have been isolated from a large number of plants. A great many investigators have been concerned with the chemistry and distribution of these colors and as a result of their researches it is known that they are widely distributed in nature and differ from each other in the number and position of hydroxyl groups and other radicles which are joined to the basic nucleus. An easy way to demonstrate the presence of flavone is to treat almost any white flower, which is not an albino, with ammonia vapor. Under these conditions, the flower will turn yellow because of the presence of a member of the flavone group.

Considerable interest has been manifested in the relation which appears to exist between yellow flavone glucosides and the innumerable shades of blue, violet and nearly all reds which are collectively termed anthocyanins (anthocyanidin glucosides). The flavone glucosides are regarded as the chromogens of anthocyanins since the available evidence tends to show that the latter pigments are formed in the plant from preexisting flavone glucosides. This view is indirectly supported by genetical investigations and by the chemical transition from flavone to anthocyanidin through reduction in acid solution. A more direct evidence has been found by Everest (2) who has shown the coexistence in purple-black pansies of the closely related pair, the flavone myricetin ($C_{15}H_{10}O_8$) and the anthocyanidin delphinidin ($C_{15}H_{10}O_7$). Reliable information on the simple chemical relationship between the flavone and anthocyanidin series of pigments was obtained when Willstätter and his students isolated and characterized over twenty different anthocyanins. A list included in Wurdack's compilation shows the plant sources from which the various anthocyanins have been obtained. It is interesting to note that the coloring matter from the beet root (3) has been established as the first member of the anthocyanin series which contains nitrogen in the molecule. The anthocyanins yield on hydrolysis anthocyanidins which differ from each other, just as the flavones do, in the number and position of the hydroxyl groups and occasionally in the replacement of an hydroxyl group by the methoxyl radicle.

IMPORTANCE OF CHLOROPHYLL AND CAROTINOIDS.

Chlorophyll is by far the most important and interesting coloring matter in the vegetable kingdom because it is regarded as the active medium in the

photosynthesis of glucose from carbon dioxide and water. The photosynthetic process is one of such great complexity that contributions of many botanists and chemists concerning it have remained largely in the hypothetical and speculative stage. On the other hand, our knowledge of the chemistry of the substances involved has been greatly extended. Willstätter's elucidation of the chlorophyll molecule is an outstanding example of such progress. As a tentative explanation of the building up of sugars from carbon dioxide and water, the hypothesis which has received the greatest recognition and which still continues to hold the field is the formaldehyde or Bayer theory. The reactions in their simplest forms which this theory suggests are as follows:

$$CO_2 + H_2O = H-CHO + O_2$$

$$6\ H-CHO \longrightarrow C_6H_{12}O_6$$

Much doubt has been felt that formaldehyde (H—CHO) is produced in the plant, but Willstätter's researches tend to strengthen the supposition that this is actually the case. The experiments of Baly, Heilbron, and Barker (4) confirm the fact that it is possible to obtain formaldehyde from an aqueous solution of carbon dioxide under certain conditions. In their work, the energy repsonsible for the reaction was supplied by the action of ultra-violet light. Of course, this does not definitely prove that the compound in question is actually formed or exists as such in the plant life processes. It does suggest interesting possibilities.

Taking it all in all, the evidence which we now possess seems convincing in showing that sugars are produced in the plant from carbon dioxide and water and that this reaction depends on the formation and subsequent polymerization of formaldehyde. While the presence of free formaldehyde in plants has not been indubitably proved, Baly and his co-workers attempt to explain any doubt by assuming the formation of a very active formaldehyde which is immediately converted into other substances. According to Willstätter a chlorophyll-carbonic acid complex is formed and by virtue of this combination the carbon dioxide is reduced to formaldehyde. It is not at all certain, if these changes take place, how the leaf manages to accomplish them in sunlight, although it has been suggested that chlorophyll acts as a photocatalyst in the process. In this instance, the photocatalyst appears to be a substance which is capable of absorbing light of longer wave-length than 350 millimicrons and subsequently radiating energy at infra-red frequencies. This energy is then reabsorbed by carbon dioxide or its complex whereby the carbon dioxide undergoes transition to formaldehyde and then to carbohydrates. Willstätter's work on chlorophyll and the recent investigations of Baly and his collaborators (5) which led to their conception of a photocatalytic mechanism of photosynthesis have suggested a multitude of fundamentally important problems which are in need of investigation. The question of energetics which plays such an important part in these reactions is in need of thorough study. The subject has hardly been touched. The suggestion of Dixon and his associates (6) that a source of energy may be the action of light displacing electrons within the chlorophyll molecule opens up an interesting and fruitful field for research.

Coming now to the possible function of carotinoids, we must admit that the subject has always been wrapped in mystery. Responsibility for this may be

traced to a lack of definite information concerning the exact constitution of these pigments. While a number of interesting suggestions have been offered as to possible rôles which the carotinoids play, the writer believes a promising field for research lies in the direction which assumes a relation of these pigments to photosynthesis. In the assimilation process it is admitted and it seems probable, that chlorophyll *b* may be formed by the action of chlorophyll *a* upon carbon dioxide. The two atoms of oxygen which are required in this reaction could be supplied during the conversion of a molecule of carbonic acid to formaldehyde. If chlorophyll *b* is formed in this way then it follows that reduction to the *a* component must take place before a transformation of carbon dioxide to formaldehyde can again proceed. It has been suggested that carotin is the reducing agent in this reaction and that it is oxidized to xanthophyll at the same time. A reconversion of xanthophyll to carotin must also follow.

It will be seen from the above that the function of carotinoids is a complex one and that the steps which have been brought forward really belong to the realm of speculation. However, it would really be a decided step forward, as the author of these suggestions has pointed out, if it could be proved that carotin could be converted into xanthophyll and *vice versa*. During a recent trip to this country Professor Baly stated in an address at Washington that xanthophyll had been obtained directly from carotin by careful oxidation.

While we have been in doubt concerning the use of carotinoids to the plant, this has not prevented our taking advantage in a practical way of certain information which was gained through studies of these compounds. Palmer (7) cites a use which was made of such information in connection with the detection of camouflaged foliage by the American Army during the war. It is well known that carotinoids in leaves reflect red light and chlorophyll green light. Owing to a predominance of chlorophyll in leaves the yellow pigments are masked to such an extent as to cause the leaves to appear green. If filters are so constructed as to transmit only light from a wide band in the red region and a little light from a narrow band in the green part of the spectrum, natural green foliage when viewed through these filters will appear red. Camouflaged foliage, however, will appear green because of the fact that green paint contains no carotinoids.

Blakeslee and Warner (8) found a correlation to exist between yellow carotinoid color in the visible skin parts of certain breeds of hens and their egg laying capacity. During laying, the yellow pigment consumed with their food selectively accumulates in the ova, while after the laying season, or in hens which have not been productive the pigment is excreted by way of the skin parts. Even before the correlation was scientifically proved, some practical poultry men recognized the fact that during the laying season, pale shanks, ear lobes, and beaks, indicated a large egg production, as a result they were able to cull out those unprofitable hens which had colored skin parts.

THE VALUE OF NATURAL COLORING MATTERS AS DYESTUFFS.

Since the introduction of synthetic dyestuffs, the use of natural dyeing materials has gradually become more and more restricted until at the present time the few vegetable dyestuffs which are still in use may be looked upon as the "survival of the fittest." During the war, when difficulty was experienced in obtaining

fast dyes, the use of natural coloring matters received a stimulus, but this was only temporary. The following list represents the most important natural dyes in use at the present time in this country.

ANNATTO is an orange-yellow dye which is used to color oils, butter, cheese, and margarine. It is prepared from the seed sheels of *Bixia arellana* which is native to Central America, East and West Indies, India and Guiana. The fruit of this shrub is a miter-shaped capsule containing 30 to 40 seeds which possess a waxy coating containing the dye.

ARCHIL and CUDBEAR are purple dyes prepared from certain lichens such as *Roccella tinctoria, R. fuciformia* and *Ochrolechia tartocea*. Oxidation in alkaline solution of colorless phenols occurring in the lichens gives rise to the coloring matter which is chiefly dihydroxy methylbenzene. Archil and cudbear were used during the war on ladies' woolen dress goods to produce bluish red colors.

CHLOROPHYLL EXTRACT, the green coloring matter of leaves, is used for coloring fats, oils, alcoholic liquids, soaps, ointments and for confectionery and preserves. Lately a product has appeared on the market under the name of "phyllosan," an active chlorophyll product, which is supposed to improve the condition of the blood by increasing hemoglobin content.

CUTCH is a noteworthy and largely used dye prepared from the wood of *Acacia catechu* and from wood of allied varieties. The *Acacia catechu* is a crooked shrubby tree growing in India, East Indies and Hindustan. Cutch is famous for its brown colors. It is used principally in dyeing and textile printing, as a tanning material, and in medicine as an astringent.

FUSTIC, the yellow dyewood from the tree, *Chlorophora tinctoria* which grows in the West Indies, Mexico, Central and South America, contains two coloring matters, the principal one belonging to the flavone group and the other known as maclurin. Fustic is widely used in wool dyeing for producing yellow to olive colors with varying mordants and still other shades by combination with other natural dyes. "Young fustic" is a totally different product from fustic. The former is derived from *Rhus cotinus* which is a tough little sumac found in Southern Europe and West Indies. The product from this source is no longer in use. During the war fustic furnished the dyestuffs for our doughboys' uniforms.

INDIGO is the dye produced from different species of *Indigoferae*. At the present time most of the indigo which is used so extensively for printing and dyeing cotton goods is synthetically produced from components of coal tar. However, there still exists a preference to use the natural product in dyeing wool by the fermentation vat and for this purpose it is cultivated in China, Japan, Philippines, Africa, Brazil and Guatemala.

LITMUS is prepared through air oxidation of a colorless product occurring in lichens which grow abundantly in Scandinavia and the French Pyrenees. It is similar in character to archil and is employed mostly as an indicator in chemistry, although use has been made of it for coloring wine and vinegar.

LOGWOOD or Campeche wood is one of the most important present-day dyestuffs. It is used almost exclusively as a black dye on such materials as silk, wool, leather, cotton, fur and straw, etc. It is particularly useful in connection with the dyeing of silk since over 200% of extract is absorbed during the process, thus acting as a weighting agent and as an aid in increasing strength. Crude logwood is the heartwood of a tall tree, *Haematoxylon campechianum*, native to Central and South America and West Indies. It is imported into this country in large quantities in the form of rough logs, and later reduced to small chips or raspings and extracted with hot water which is concentrated to 51° Tw. From logwood extract other products are made by oxidizing the coloring matter hæmatoxylin to a compound known as "hematine." The latter substance may be obtained in either the liquid or solid form.

OSAGE ORANGE or bow wood is obtained from the native born North American trees known botanically as *Maclura pomiferum*. It grows extensively in Oklahoma, Texas and Arkansas. The coloring matters present in osage orange are the same substances which occur in fustic, consequently osage orange extracts have displaced fustic to some extent.

PERSIAN BERRIES are the dried half-ripe fruit of *Rhamnus* sp. They are used principally in cotton printing for yellow, orange, and olive-green shades. The chief coloring matter is the yellow flavonol, rhamnetin, which occurs in the berries in the form of its glucoside.

QUERCITRON is a domestic dyestuff consisting of the ground inner bark of *Quercus velutina* or black oak which grows in the Eastern United States. The coloring matter quercitrin, a flavonol rhamnoside, is obtainable either as the powdered bark or in the form of concentrated preparations known as "flavine." Quercitron and flavine are very important dyestuffs.

As far as the writer is aware there are now no anthocyanin preparations which have assumed any commercial importance. Even though the natural anthocyanins possess brilliant shades which leave nothing to be desired and cannot readily be matched by means of artificial dyes, yet the shades produced, while being very fast to light, are fugitive with respect to alkalies and acids and to washing. Nevertheless, interest is being attached to these pigments because they represent a chemical makeup which indicates high tinctorial power.

PIGMENTATION IN CONNECTION WITH PROBLEMS OF INHERITANCE.

From the standpoint of fundamental research, flavone glucosides and anthocyanins are important in connection with problems of inheritance. Anthocyanin colors have attracted geneticists because they have afforded an almost unlimited supply of material for Mendelian research, consequently a great deal has been learned concerning the genetical constitution of certain plants with respect to pigmentation. A combination of chemical and genetical lines of endeavor should make it possible to give a chemical interpretation to Mendelian color factors. To make this clear a simple illustration may be cited. A sweet pea plant bearing purple flowers may be obtained by crossing two white flowered strains of certain genetical constitutions. From this it is evident that the two white flowered parents have inherited, between them, the ability to produce chemical substances necessary for the production of anthocyanin. It has been suggested in a general way by Miss Wheldale (9) that one parent contains a chromogen (flavonal glucoside) and the other an enzyme which acts upon this chromogen to form anthocyanin. The object of research is to isolate and identify these substances and to determine the actual process involved in the production of anthocyanin.

It goes without saying that the train of reactions responsible for the formation of chromogen and anthocyanin in such cases must be exceedingly complex. In fact, the available evidence would seem to indicate that cases of extreme simplicity are not often to be expected. We have, for example, a more complex situation (10) in the case of Emerson's series of colors in maize in which six main color types have been established as follows: (*a*) purple, (*b*) sun-red, (*c*) dilute purple, (*d*) dilute sun-red, (*e*) brown, and (*f*) green. The genetical relations of these six types have been established. There can be little doubt that the phenomena observed in the course of the genetical studies have a discoverable chemical basis. It is the problem of the chemist to disentangle and isolate the substances whose combination is responsible for the observed phenomena. Thus far no series of color typed of known genetical constitution has been thoroughly examined chemically, although an excellent beginning in this work was made by Wheldale and Bassett (11) in connection with the isolation of flavones from two yellow varieties of *Antirrhinum*. Investigations of this kind, which have in view a chemical interpretation of Mendelian character, would be helpful in an understanding of interacting factors in heredity.

Pigmentation in plants is not only of fundamental importance to the genet-

icist but it has considerable value to the practical plant breeder who is constantly attempting to intensify desirable qualities in fruits and vegetables and to eliminate objectionable ones. Many correlations occur between color and other plant characters which sometimes enable the breeder to use color as a valuable index in selection. In a number of cases pigmentation seems to bear a relation to flavor, acidity, sweetness, and astringency. Beach (12) gives the following statement concerning the relation of color in apples to quality:

> "The quality of the fruit corresponds in a general way with the development of the color of both its skin and its flesh. It has already been observed in speaking of the color of the flesh that under certain conditions it is not normally developed. When the color of either the skin or the flesh is not properly developed, there is a corresponding lack of development of the quality of the fruit. This statement may be easily verified, as already noticed, by testing highly colored Northern Spy apples in comparison with poorly colored fruit of the same variety. It will be found that the poorly colored fruit, even though it may have been produced on the same tree as that which bore the highly colored fruit, is decidedly inferior in quality."

Analyses from various sources (13) show that white currants are sweeter and contain less acid than red currants. In the case of the beet we find the white varieties containing more sugar than the red ones. Sufficient data are lacking in other cases to justify definite conclusions, but the impression seems to exist that white-fleshed watermelons, yellow raspberries, yellow table beets and white carrots, are sweeter than the corresponding red varieties. According to Caldwell (verbal communication) a relation seems to exist between soluble red color in grapes and astringency. The more astringent grapes appear to be the darker colored ones.

A correlation has been discovered by Hedrick (14) to exist in the peach between the inside color of the calyx cup and the flesh color. The observations, which were made on two trees of each of three hundred and seven varieties, showed that flowers whose calyx cups were colored green inside produced white-fleshed peaches, while those having calyx cups of an orange color developed into yellow-fleshed fruits. This correlation has proved of practical value in peach breeding because of the time saved in a predetermination of flesh color. Ordinarily, the first crop of blossom seldom sets fruit, and the correlations have made it possible to know the flesh color a year or two in advance of fruiting.

Another correlation in the case of the peach which has practical application is the relation which has been found between the time of blossoming and the bark color of the branches. The time of swelling of peach buds in early spring is very important because of the danger of frost injury, a delay in blossoming for several days being sometimes sufficient to prevent the loss of the crop. Whitten (15) has shown that varieties possessing green branches blossom later than those having purple-colored branches. Even on the same tree the branches showing less purple color will produce flowers later than more highly colored ones. The cause of this phenomenon is due to the fact that different coloring matters absorb heat rays in varying degrees. It is well known that green leaves in general register lower temperatures than red ones and this is also true in the case of green and purple peach twigs. The effect of higher temperatures on peach buds is to cause them to advance more rapidly. One would be expected to conclude from these results that peach varieties with green branches would be less susceptible to injury from early frosts

and would be more desirable than trees bearing purple-colored branches. Unfortunately, other considerations such as character and size of fruit have prevented the selection of these hardier varieties for commercial purposes. Perhaps as a result of breeding it might be possible to discover green-stemmed varieties which will at the same time bear desirable fruit. It has been suggested that whitewashing peach trees might serve as a protection against disastrous injury from frost. Such a procedure has been found to delay blossoming from two to six days.

An example of the association of color with qualities undesirable from the standpoint of canning is found in peas. Nearly all peas from vines bearing colored flowers blacken on cooking and this dark color is imparted to the liquor in the can making a discolored product which is very objectionable to the consumer. From the viewpoint of the canner the best peas bear white flowers. In 1920, a blackening of canned peas caused considerable loss. The condition was caused by the admixture of a field pea, known as Bengalia, with an Alaska pea. The former bears pink flowers in the field, while the latter has white flowers. The two varieties are not related genetically, hence the mixture was a purely mechanical one.

One of the aims of the plant breeder is to develop highly colored varieties of fruits and vegetables. For example, canning factories desire a tomato richer and brighter in color than the ones we now have. This desire for more color in the natural product is mainly to offset for the reduction of carotinoid pigment which occurs during processing because of the ease with which it oxidizes. Without a means for the quantitative determination of color, the breeder must depend on the eye to indicate whether or not proper crosses or selections are being made. If judged by eye alone, as much as a ten per cent increase in color could easily be overlooked. The chemist's part is concerned with development of methods for pigment determination. Such methods would be useful also in determining any change in color content of a certain variety from year to year, and in the same variety grown at different localities.

POSSIBLE RELATION OF PLANT PIGMENTS TO DISEASE RESISTANCE.

One of the recent developments in connection with the study of pigments is their possible relation to disease resistance in some plants. Such a relation has been suggested by Walker (16) in the case of the onion, in which he showed that white varieties are susceptible to smudge (*Colletotrichum circinans*) while colored varieties, with bulbs containing flavones and anthocyanins, show a high degree of resistance.

In addition to the onion a number of cases have been noted where a correlation seems to exist between resistance and pigmentation. Fromme and Wingard (17) state that all varieties of beans with solid red or red-mottled seed which were examined, were resistant to rust (*Uromyces appendiculatus*), while white-seeded varieties were more susceptible as a class than those of any other color. Purple-skinned varieties of sweet potatoes seem to show more resistance to the soil rot than white or yellow-skinned varieties. White carnation plants are much more subject to stem rot than are the colored types. In the case of apple scald, which is a storage disease not attributable to any organism, we have a striking illustration of a greater liability to injury in the less colored parts. The red areas of the skin seem to remain freer from browning or scald effects than other portions of the

same fruit. It may be interesting to point out here the possible relation (18) of flavones to browning of scalded apples. A flavonol is undoubtedly the parent substance of the anthocyanidin or red pigment of the apple. It appears, therefore, that those areas which contain the unchanged flavonol are more subject to scald than the areas in which the flavonol has been converted into anthocyanidin. Proof that flavonols are capable of giving rise to brown oxidation products has been supplied by the investigations of Nagai (19) which show that brown or reddish brown pigments are formed from flavonols when treated with oxidases. Since a flavonol and oxidizing enzymes are normally present in the apple, a possible connection between flavonol and scald browning becomes more apparent. It must be borne in mind, however, that other substances such as tannins are also capable of giving rise to brown oxidation products under certain conditions.

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CINCHONINE AS A TANNIN PRECIPITANT, WITH SPECIAL REFERENCE TO THE ANALYSIS OF CUTCH AND GAMBIER.

BY DAVID HOOPER.

The cinchonine method of A. Chaston Chapman (*J. Inst. Brewing*, 1907, 13, 646–657; 1909, 15, 360–374), elaborated by him for the determination of tannin in hops, has been extended with concordant results to a number of other tannin-containing materials. The method has been found of special value for the determination of tannin in cutch and gambier, since cinchonine does not precipitate catechin. Hide-powder, on the other hand, absorbs catechin.

REPORT ON PROXIMATE ANALYSIS OF EUPHRASIA.*

(*Euphrasia Officinalis* L. Order, Schrophulariaceæ, Eye-Bright.)

BY WILLIAM E. MELTON AND L. E. SAYRE.

Attention has been called recently to the value of *Euphrasia officinalis* (Eye-Bright) by one of the leading manufacturing houses in the East, stating that the medical profession is using the drug successfully in the treatment of certain catarrhal conditions. As there had been published no satisfactory or complete analysis of the drug, it was suggested that such an analysis would be of special interest. This gave the writer an incentive for the undertaking. Accordingly a quantity of the drug was obtained for this purpose. It may be mentioned, incidentally, that the literature pertaining to Euphrasia was deemed fairly well represented in King's American Dispensatory, third revision, pages 751, which is in substance as follows:

"Action and medicinal uses—slightly tonic and astringent the drug is used in infusion or poultice in catarrhal ophthalmia. It also is of service in mucous diseases attended with increased discharges; and in coughs, hoarseness, earache, and headache, which have supervened in catarrhal affections.

"It is also used in acute catarrh (fluent coryza) and to control inflammatory and catarrhal phases of the parts during or following an attack of measles. Also averts unpleasant after effects, as catarrhal conjunctivitis, nasal catarrh, catarrhal deafness, etc.

"Catarrhal diseases of the intestinal tract may also be treated with Euphrasia.

"In epilepsy four fluid ounces of the infusion taken in the morning on an empty stomach and at bed time is asserted to be successful in curing this ailment.

"Specific indications and uses are: Acute catarrhal diseases of the eyes, nose and ears; fluent coryza with copious discharge of watery mucous secretion of acrid mucous from the eyes and nose with heat and pain in frontal sinus. (Scudder.)

"The dose of specific Euphrasia is one to sixty drops while the dose of the infusion is two fluid drachms to four fluid ounces."

It should be understood that "specific" when applied to medicinal preparations denotes a class of preparations of such "standard" strength as to meet certain specific indications in treatment, therefore it is impossible to state the exact strength. The dose of such preparations is regulated and determined by the practitioner.

DESCRIPTION.

There are a number of species of Euphrasia common to the United States, but *Euphrasia officinalis* is described as:

"An elegant little annual plant, with a square downy, leafy stem, simple or branched, and from one to five inches in height. The leaves are very small, almost entirely opposite, ovate or cordate. The flowers are minute axillary, solitary, very abundant, and inodorous, with a brilliant variety of colors. The calyx is companulate and four-cleft. Stamens, four, fertile under the upper lip: Anthers violet, lower cells of the upper ones with a long spur. Pods oblong and flattened. The seeds are numerous, oblong, and grooved lengthwise."

Our supply of the plant is dependent upon European importation. The *indigenous* plants of this genus are characterized by very small flowers, some

* Presented before Scientific Section, A. PH. A., Buffalo meeting, 1924.

borne on compact leafy heads or short racemes, some species with white carolla, with lavender or purple veins and "yellow eye" and so forth. In the Euphrasia Americana the corolla is relatively large and showy. (Gray.)

The commercial powder of this drug, under the microscope, showed quite a quantity of sandy material, accounted for, doubtless, by the fact that the plant is very small being only from one to five inches in height and growing close to the ground, so that when collected it carries with it this inert material.

It may be mentioned in passing that according to King's Dispensatory, Lobelia was originally called "Eye-Bright," but the name properly belonged to *Euphrasia officinalis*. We are indebted to H. K. Mulford of Philadelphia and J. U. Lloyd of Cincinnati for samples of the drug, as obtainable in the market.

It will be seen from the accompanying illustration of the tissues as observed under the microscope, that the powder we have analyzed did not consist wholly of leaves but includes in addition, stems, flowers, and seeds. We are now endeavoring to import an authentic specimen of the whole plant in order to study it more closely and compare it with the commercial product we have obtained for analysis. From a dried specimen of the whole plant, which was sent us by J. U. Lloyd, the powder of which we submitted to microscopical analysis shows more of the stem constituents, such as bast fibers, than was contained in the original sample and less trichomes and epidermal tissues from the leaves. This latter powder was of a much lighter color (very much less green) than the powder sent us for analysis. The phloroglucin and hydrochloric acid test

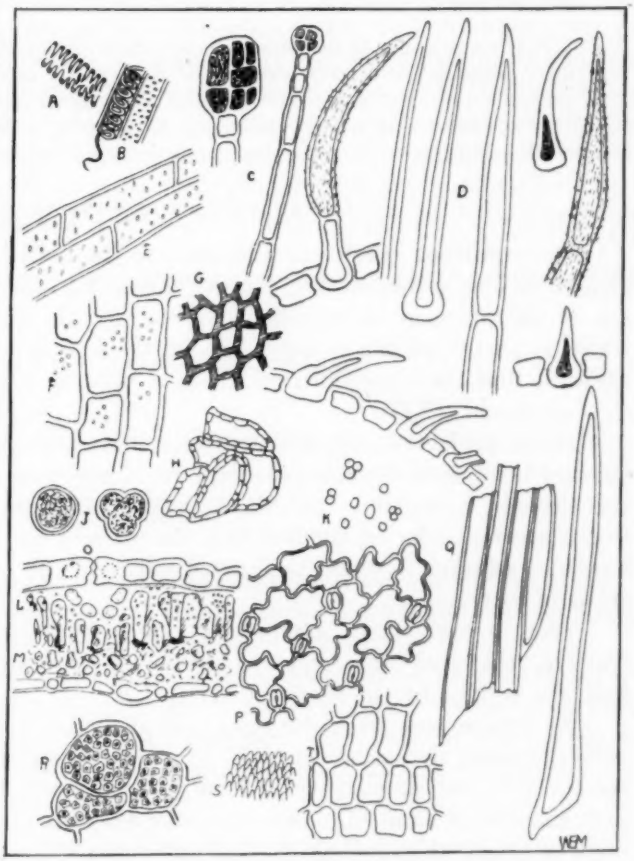


Plate No. 1. 200 Diameters.

Explanation of drawings: *A*, reticulate ducts; *B*, spiral and porous ducts; *C*, glandular trichomes; *D*, non-glandular trichomes; *E*, porous parenchyma; *F*, parenchyma tissue, containing chlorophyll grains; *G*, cork tissue; *H*, epidermal cells; *J*, pollen grains; *K*, starch grains; *L*, *M*, *O*, palisade cells, spongy tissue cells and stoma; *P*, epidermal tissue, showing stomata; *Q*, bast fibres; *R*, epidermis of seed coat (testa) vertical view; *S*, section of corolla; *T* parenchyma cells.

brings out this distinction quite markedly, showing more lignified tissues in this latter powder. In other words the powder furnished for analysis was not a powder from the whole plant.

ANALYSIS.

An analysis recorded in King's Dispensatory is substantially as follows:

"The recent leaves of the plant are commonly employed. Water extracts their virtues. Eng (1859), examining the recent plant, found it to contain mannit, grape sugar, volatile oil in small amount, an acrid bitter principle, cellulose, and other plant constituents, besides a number of acids of organic character, and tannin, the latter giving a deep green coloration with ferric compounds, and a bright light green reaction with the salts of lead."

ANALYTICAL PROCEDURE.

The powdered drug[1] was submitted to the action of various solvents as indicated in the accompanying report. From the analysis it would appear that one of the pronounced ingredients of the drug is of a very resinous character, which is partly soluble in ether and partly soluble in alcohol. From this it is assumed that there are different kinds of resinous products present as confirmed by experiment (XII).

In the subjoined table resinoids are noted under (III D), (IV A) and (XI A), the first being from the ethereal extractive of the drug while the second was from the alcoholic extractive. In (XI A) a larger amount of resinoid was obtained; this is accounted for by the fact that the resinoid was precipitated by adding the alcoholic solution to water acidulated with two per cent hydrochloric acid instead of water alone.

From a preliminary microscopic examination of the air-dried alcoholic extractive, the drug was found to contain a large number of oil globules which fact was verified by the results under (III B).

As will be seen from the report on alkaloids under (III E) positive results were obtained, though under (XV) in which the prollius fluid was examined the results were not satisfactory. While we believe that this drug contains a minute amount of alkaloid, more conclusive evidence should be obtained by a thorough analysis, time for which was not obtainable.

From the average of four determinations for nitrogen which gave 1.633 per cent of this element, the per cent of albumin was computed by using the factor 6.33. In the determination of the tannin, some trouble was experienced with the method used. An aqueous extract of the fat-free powder was precipitated with a two per cent solution of strychnine acetate;[2] the first precipitate which came down was filtered off after standing about an hour, and after drying and multiplying by the factor 0.6558 gave 1.841 per cent of tannin. The filtrate was allowed to stand several hours and as it was noticed that another precipitate formed, it too was collected and weighed giving 0.673 per cent. Subsequently more precipitate subsided but this latter was not used in computation.

[1] In making weighings for the different determinations reported some trouble was experienced from the fact that the air-dried powder was not constant in weight and changed considerably while on the balance.

[2] "Martindale, Extra Pharmacopœia" 17th Ed. p. 99.

The volatile matter from the drug powder was determined by steam distillation, the distillate was shaken with ether and the ether evaporated spontaneously as noted under (XIII A). This residue was dissolved in alcohol and poured into a small amount of distilled water. Upon putting a drop of this solution on the tongue a marked tingling sensation was produced.

It will be noted under (XIII B) that the drug seems to contain sublimable principles which for want of time were not investigated by extraction, etc. In Kraemer's "Applied and Economic Botany," page 173, several pages are devoted to this subject, stating that such substances as arbutin, a glucoside, had been found in a number of plants of the *Erecaceæ* by sublimation, as well as many other principles in such drugs as Cinchona, Rhamnus, Purshiana, Rheum, Hydrastis, Coca, and many other drugs. An extended study of the principles extracted by microsublimation as described in the above-mentioned references would more than likely prove very interesting.

The Hortvet Microsublimator will be used in this connection in further investigations.

LABORATORY DETERMINATIONS.

I.—Moisture Determination.

A definite weight of the finely powdered air-dried drug consisting of leaves of the plant was subjected to a temperature of 105° C. until the weight was constant, the produce was cooled in a desiccator and weighed.

II.—Ash Determinations.

The powdered drug, which was light and bulky, was incinerated and ashed in a porcelain crucible; the process was continued until a white ash was obtained; this was cooled in a desiccator to constant weight, and weighed.

The various fractions: those soluble in water in hydrochloric acid, and in sodium hydroxide, and the final insoluble residue, were obtained by the usual method in ash analysis. The various fractions obtained are stated in the subjoined table, which is the average of four determinations. (See tabular statement.)

III.—Ethereal Extract.

The powdered drug was percolated with ether in a continuous extractor (Soxhlet) for ten hours. The extract was evaporated to dryness and the weight of the residue recorded. This extract was treated as follows:

A. Volatile Oil.—The ethereal extract obtained above was treated with water, and evaporated to dryness at 100° C. and heated to 110° C. to drive off volatile matter. The difference between the weight of the residue and the original weight of the extract before heating is recorded as volatile oil.

B. Fixed Oil.—The dried extract from above was treated with small quantities of petroleum ether until all fatty substances were removed, after which the liquid was filtered off, and evaporated after drying, the residue was weighed and recorded as fixed oil.

C. Alcoholic Extract of Ethereal Residue.—The residual extract remaining after treatment with petroleum ether together with the filter, was macerated for ten hours in 80% alcohol. An aliquot portion was evaporated, dried, and weighed, and is recorded as Alcoholic extract from Ethereal Residue.

D. Resinoid from Ethereal Extractive.—The remaining portion of the alcoholic solution was concentrated to a small bulk and poured into twenty parts of distilled water. The precipitate was collected on a weighed filter, dried, weighed, and is recorded as Resinoid from Ether Extractive.

E. Waxy Residue.—The residual extractive remaining after treating the ethereal extractive with water, petroleum ether, and 80% alcohol, was dried and weighed and is reported as waxy residue. The physical properties being: dark green in color, practically no taste, insoluble in water, partly soluble in ether, and nearly entirely soluble in alcohol.

F. Alkaloid.—The filtrate from (*D*), alcoholic liquid from which resinoids were precipitated, was examined for alkaloids and gave the following results: A drop of the filtrate was put on a watch crystal, and acidulated with a small drop of dilute sulphuric acid, after which a drop of Mayer's reagent was drawn into it with a glass rod. A white precipitate appeared at once. The same procedure, using Wagner's reagent, gave an affirmative result.

A microscopic examination of the filtrate after concentration and filtering through cotton showed small scattered amorphous particles. Upon addition of Mayer's reagent these particles were increased in number, crystals of potassium iodide coming down later. The examination of the filtrate with Wagner's reagent gave an amorphous precipitate with the potassium iodide crystals coming down as the solution on the slide evaporated spontaneously.

When the above solution was tested it produced very benumbing effects which lasted for a half hour or more.

IV.—Alcoholic Extractive of Ether Marc.

The drugs remaining after treatment with ether were extracted with 80% alcohol by the Soxhlet continuous extraction method. An aliquot portion of the solution was evaporated to dryness on a water-bath, dried and weighed, being reported as alcoholic extractive of ether marc.

A. Resinoid.—The remaining alcoholic extract was evaporated on a water-bath to small bulk and poured into 20 parts of water, the precipitate collected, dried, weighed, and reported as resinoid from alcoholic extractive.

B. Vegetable Acids.—To the filtrate from (*A*) a solution of neutral lead acetate was added, the precipitate collected, washed, dried, and weighed. The precipitate was removed from the filter and the filter burned in a weighed crucible with a little ammonium nitrate to insure ignition and to prevent reduction of lead, the precipitate was then transferred to the crucible and incinerated at low heat, and finally ignited until the weight was constant. Upon deducting the weight of the residue from the weight of the precipitate the weight of the vegetable acids precipitated by lead was found.

C. Saccharine Matter (*Glucose*).—To an aliquot portion of the filtrate from (*B*) a solution of lead subacetate was added, the precipitate filtered off and the excess lead removed from the filtrate by acidulating it with hydrochloric acid and passing hydrogen sulphide into the warmed solution. The clear liquid was neutralized, made up to a definite volume and determined quantitatively for sugar with Fehling's solution.

The Munson and Walker Method III was used in this determination and the

per cent of glucose found from reference to the table attached to the above method.

D. Residual Extractive.—The remaining portion of the filtrate from (*B*) was treated with hydrogen sulphide as in (*C*) to remove the lead, evaporated to dryness on a water-bath, dried, and weighed. From this weight the weight of the glucose was subtracted and the remainder reported as Residual Extractive.

The tests for alkaloids with Mayer's and Wagner's Reagents were very unsatisfactory.

V.—Aqueous Extract.

The dregs remaining after treatment with ether and alcohol were macerated for twelve hours in 75 cc. of water, the liquid filtered off and made up to 100 cc. by pouring through the filter the required amount of water. The extractive in 50 cc. of this solution was determined and is reported as Aqueous Extractive from Ether and Alcoholic Dregs.

A. Gum.—The other 50 cc. of filtrate from (V) was concentrated on a water-bath to 25 cc. and to this was added 50 cc. of absolute alcohol, the mixture placed in a cool place for twenty-four hours to allow the gum to precipitate, which was filtered off, dried, weighed and reported as gum.

B. Albuminoid Extractive Matter.—The extractive remaining in the filtrate from (*A*) was determined by evaporation after which it was dried and weighed and is reported as Albuminoid Extractive matter.

VI.—Sulphuric Acid Extractive, from Ether, Alcohol and Water-extracted Dregs.

The dregs remaining after extraction with ether, alcohol and water, were dried and transferred to a flask provided with a reflux condenser and boiled for three hours with water containing 1% by volume of sulphuric acid (sp. gr. 1.84) using 100 cc. of this mixture for each gram of the residue. An aliquot portion of the filtrate obtained after filtering out the dregs was evaporated, dried and weighed and is reported as Sulphuric Acid Extractive.

A. Reducing Substances.—The remaining portion of the filtrate obtained from (VI) was tested for sugar, which should now be present through the hydrolysis of the starch. This hydrolysis having been brought about from boiling the dregs containing the unextracted starch with acidulated water in (VI). The process used was the Munson and Walker method as stated under (IV C) which depends upon the reduction of Fehling's solution and the weighing of the resulting copper oxide, after which this weight is multiplied by the factor 0.9 which should give the weight of starch and allied substances. From the microscopical examination of the drug very little starch was seen, we would say not over 0.5%, while from the above determination 9.684% was indicated, the difference being no doubt accounted for by some reducing substance contained in the filtrate from (VI). Consequently instead of reporting this as Starch and Allied substances we are reporting it as Reducing substances.

VII.—Sodium Hydroxide Extractive from the Ether, Alcohol, Water and Sulphuric Acid-extracted dregs.

The dregs remaining after extraction with the above were dried, powdered and boiled with water containing a 2% solution of Sodium hydroxide (2 Gms. of NaOH in 100 cc. of water) for one hour. From an aliquot portion of the filtrate the total extractive was obtained and is recorded as Sodium Hydroxide Extractive.

VIII.—Cellulose.

The dregs remaining after treatment with NaOH were washed with water, alcohol and ether, dried and weighed, after which they were ignited in a crucible, cooled in a desiccator and weighed again. The weight of the ash subtracted from the weight of the dregs is reported as cellulose.

A. Insoluble Residue (Sand).—The residue remaining after igniting the dregs in VIII is reported as Insoluble Residue (Sand). The discrepancy of 0.285% between insoluble residue here and that obtained in the ash determinations is probably due to the fact that in the ash determinations the 2% HCl used gave a soluble chloride which was not the case when 1% H_2SO_4 was used in the above determinations.

IX.—Nitrogen.

In the determination of nitrogen the Dyer modification of the Kjeldahl was used. The mean of four determinations is calculated to its equivalent in albuminoids by multiplying it by the factor 6.33 and is reported as Albumin.

X.—Tannin.

A definite weight of the powdered drug from which the fat had been removed with petroleum ether was macerated in water, the aqueous extract filtered off and the Tannin precipitated by the addition of a 2 per cent solution of strychnine acetate IV. The precipitate was collected, dried and weighed. The weight of the precipitate multiplied by 0.6558 gives the weight of Tannin.

XI.—Alcoholic Extract of the Drug.

100 Gms. of the drug was macerated with 500 cc. of 95 per cent alcohol for ten days with occasional agitation after which 10 cc. of the clear alcoholic liquid was drawn off with a pipette and allowed to evaporate in a petri dish, weighed and recorded as alcoholic extract of drug.

A. Resinoid (Precipitated with HCl).—The alcoholic extract after being weighed was redissolved in the least amount of alcohol required and this solution poured into 2 per cent hydrochloric acid in a small stream while stirring. The resulting precipitate was collected, dried, weighed and is reported as resinoid precipitated with HCl. The resinoid obtained was found to be very soluble in chloroform, partly soluble in ether, and partly soluble in alcohol. As the resinoid was dissolved out of the drug originally with alcohol, the fact that the resinoid is not now entirely soluble in it is accounted for by assuming that the resinoid was soluble in some constituent which was removed when it was precipitated and filtered.

B. Alcoholic Residue.—Upon evaporating the filtrate from (*A*) after the resinoid had been precipitated a black-brown sticky substance was obtained which was dried and weighed and found to be soluble in water, insoluble in chloroform, partly soluble in ether, and entirely soluble in alcohol.

XII.—Report on Resinoids.

The concentrated alcoholic solution of the drug was precipitated by adding this concentrate to water. An effort was made to fractionate the precipitate which was resinous, by adding successively different quantities of water to the alcoholic concentrate. After each successive addition of water the precipitate resulting therefrom was collected in four portions:

	Percentage of different resins.
First, precipitate when dried gave	1.3648
Second, precipitate when dried gave	0.7476
Third, precipitate when dried gave	0.2608
Fourth, precipitate when dried gave	0.2304
The total Resinoid precipitate	2.6

Characteristics of Fractional Resinous Precipitates.—First precipitate: Resinous, somewhat sticky, mass mostly soluble in ether and slightly insoluble in alcohol. A small portion of it only was soluble in alcohol. Second: Soluble in alcohol, slightly soluble in ether. Third and Fourth: Soluble in alcohol only.

XIII.—Volatile Matter.

Ten grams of the drug was steam distilled, by running steam into an aqueous mixture of the drug, for thirty minutes, collecting in that time forty-five cc. of the distillate which was shaken out with ether and the ethereal solution allowed to evaporate spontaneously on a tared watch crystal and weighed.

A. Sublimable Principles.—A few grams of the powdered drug were placed in a crucible and subjected to sublimation, a small funnel with a long neck was inverted and placed over the crucible. A light brown sticky substance which became crystalline when cold was deposited in the far end of the neck of the funnel. This deposit appeared to be soluble in water, alcohol, and chloroform but nearly insoluble in ether.

XIV.—Fat.

A definite weight of the drug was macerated in petroleum ether several days with occasional agitation, after which the liquid was filtered off and allowed to evaporate spontaneously, redissolved in the same menstruum and evaporated again, dried and weighed.

XV.—Test for Alkaloids.

A definite weight of the powdered drug was macerated in prollius fluid No. 1, which consisted of:

Chloroform	20 parts
Alcohol	76 parts
Ammonia Water	4 parts

for seven days, at which time the liquid was decanted off and allowed to evaporate. To the dregs was then added prollius fluid No. 2 which consisted of:

Ether	68 parts
Chloroform	22 parts
Alcohol	7 parts
Stronger Ammonia Water	10 parts

this being allowed to stand forty-eight hours after which the liquid was filtered off and added to prollius fluid No. 1 and the combined liquids evaporated to a syrupy consistency at 50° C., to remove the solvents, mainly alcohol. The syrupy liquid was re-dissolved in ether, the ethereal solution shaken in a separating funnel several times with small portions of 1% H_2SO_4 and the acid washings were drawn off and combined.

As the acid washings were more or less colored an attempt was made to remove this color so that it would not interfere with the alkaloidal tests by washing it with chloroform and then with ether but very little color was removed so the acid washings were made alkaline with ammonia and again shaken out with ether, the ethereal solution drawn off and shaken with small portions of 1% H_2SO_4 which appeared nearly colorless. This acid solution was tested for alkaloids with Mayer's reagent and gave the following results:

Mayer's Reagent.....1st test.....doubtful
After standing 24 hours.....doubtful

The acid solution was concentrated and again tested with Mayer's Reagent from which the following results are reported.

Mayer's Reagent on Concentrated Acid Solution
1st test.....very light precipitate
After standing 24 hours.....very little change.

TABLE OF CONSTITUENTS.

	Ash.	Drug.	Per cent.
Moisture, I			10.089
Ash, II			8.646
Ash Soluble in Water	28.336	2.450	
Ash Insoluble, Soluble in HCl	47.592	4.115	
Ash Insoluble, HCl Soluble in NaOH	10.629	0.919	
Ash Insoluble, Residue	13.443	1.162	
	100.000	8.646	
Ethereal Extractive (Soxhlet) III			10.120
		Per cent.	
Volatile Oil III, A		0.162	
Fixed Oil III, B		6.605	
Alcoholic Extractive from Ethereal Residue III, C		1.205	
Resinoid from Ethereal Extractive Residue III, D		0.515	
Waxy Residue III, E		0.872	
		9.359	
Alcoholic Extractive of Ether Marc IV			13.566
Resinoid from Alcoholic Extractive IV, A		0.504	
Vegetable Acids precipitatated by Lead IV, B		4.131	
Saccharine Matter (Glucose) IV, C		0.866	
Residual Extractive IV, D		8.061	
		13.562	
Aqueous Extractive from Ether and Alcoholic Dregs V			9.923
Gum V, A		3.384	
Albuminoid Extractive Matter V, B		6.470	
		9.854	
Sulphuric Acid Extractive from Ether, Alcohol and Water extracted Dregs VI			20.446
Reducing Substances VI, A		9.684	
Sodium Hydroxide Extractive from previous extracted dregs VII			20.500
Cellulose VIII			14.090
Insoluble Ash (Sand) VIII, A			1.446
Nitrogen (calculated to Albumin) IX			10.348
Tannin X			1.841

Alcoholic Extract of the Drug XI		13.323
Resinoid (Precipitated with HCl) XI, A	4.300	
Alcoholic Residue XI, B	9.020	
	13.320	
XII, See above		
Volatile Matter (From steam distilling) XIII		0.024
Fat (From Petroleum ether extraction of the drug) XIV		0.644
XV, Alkaloids, See above		

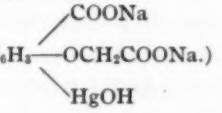
CONCLUSION.

The investigation, such as the writer has endeavored to make, has aimed to isolate the proximate principle or principles upon which the drug seems to depend for its alleged medicinal properties. The separation of the various constituents, as detailed in the accompanying outline, seems to indicate that the medicinal properties are contained in aromatic resinous bodies. The presence of volatile oil is evident as will be observed in the record of the analysis. Preparations of the drug for catarrhal conditions, such as a tincture or a syrup, are blended with other expectorants and sedatives affecting the irritated mucous membrane either locally or remotely. The tincture which has a deep olive-green color has a decided characteristic herby taste, having a rather soothing sensation to the mucous surfaces of the mouth and throat, leaving a slight tingling sensation not very unlike a mild local anaesthetic. It should be stated that the high percentage of fat and oil, it seems to the writer, can be accounted for only by the presence of fat soluble coloring matter and the presence of considerable seed in the powder.

Our investigation seems to indicate that the statement made in King's Dispensatory—"that the medicinal principles may be extracted with aqueous menstrua" should be corrected, as they seem to the writer to be misleading since the resinous bodies, in which the virtues seem to reside are only soluble in an alcoholic, hydroalcoholic, or similar menstrua.

UNIVERSITY OF KANSAS,
LAWRENCE, KANSAS,
JUNE 1, 1924.

THE ELIMINATION OF MERCURIALS WITH PARTICULAR REFERENCE TO MERCUROSAL.*

(DI-SODIUM-HYDROXYMERCURI-SALICYL-ACETATE,  .)

BY L. W. ROWE.

In a previous article[1] the relatively low toxicity of mercurosal was demonstrated by experiments upon animals. Its comparative freedom from corrosive action upon the wall of a vein was also determined by intravenous injections into animals.

The present article will deal first, with the study of the excretion of mercurosal both from a qualitative and quantitative standpoint, and second, with its

* Scientific Section, A PH. A., Buffalo meeting, 1924.

lack of corrosive action upon the organs of excretion. Other mercurials have been included for the purpose of comparison.

The following is a brief statement of the chemical method[1] used by A. G. Flieger in the analysis for mercury content of samples of excreta submitted to him:

To a liter of dog urine or 50 grams of feces, is added 50 to 100 cc. of concentrated hydrochloric acid; the organic matter is destroyed by heating on a sand-bath at 70° to 80° C. for three hours, adding gradually 5 to 6 grams potassium chlorate. The chlorine is blown out by air (approximately 3 hours). Filter through a Buchner funnel and pass hydrogen sulphide into the filtrate. Filter off the sulphide residue. Again decompose this sulphide residue with 10 cc. concentrated hydrochloric acid and 0.5 Gm. potassium chlorate in an Erlenmeyer flask under a reflux condenser. Dilute with water and blow out the chlorine. Filter, make slightly alkaline with ammonium hydroxide and pass in hydrogen sulphide. Mercuric sulphide will come down free from sulphur as a black ppt. Filter on tared filter papers. The following table gives data on samples of urine to which a known amount of mercury bichloride was added, in order to test the method.

Weight of mercury. Added to one liter, calculated to Hg.	Weight of mercury. Found in one liter, calculated to Hg.
0.0012 Gm.	0.0017 Gm.
0.0027 Gm.	0.0033 Gm.
0.0065 Gm.	0.0060 Gm.
0.0094 Gm.	0.0090 Gm.
0.0127 Gm.	0.0115 Gm.

It shows that there is an average error of about 15% in the results.

A search of the literature reveals the fact that while a good many articles deal with renal elimination of mercury, very little quantitative data has been published relative to intestinal elimination.

The chief reason for this is easily discerned when one attempts to collect such experimental data and is confronted with the difficulties incidental to such work. The pharmacological work is in some respects disagreeable and tedious, but the chemical isolation of minute amounts of a volatile substance such as mercury from large amounts of organic materials such as feces is very difficult.

From many sources, including the latest edition of "Sollmann's[2] Manual of Pharmacology," the opinion is obtained that soluble compounds of mercury are largely excreted by the kidney.

However, Cushny[3] in his short discussion on the elimination of mercury states that, "No accurate estimation of the mercury excreted in the feces has been made, but it is believed that less is excreted here than in the urine at first, but that later the greater part may pass out by the intestine."

Ramsay and Groebner[4] find that the bichloride, when given hypodermically in single small doses, continues to be eliminated for six or seven days through the kidney.

Beinhauer[5] reports that there is an appreciable renal elimination of mercury following small internal doses of calomel.

MacNider[6] who has done a great deal of work on the kidney injury caused by elimination of mercury, finds that dogs dosed internally with lethal amounts of the bichloride often die from delayed kidney injury, and that this action on

[1] This method is a modification of one published in *Chem. Zentral Blatt.* 2, 60 (1921) (Fabre). The original article is in *Jour. de. Phar. et. Chim.*, 7, 22 (1920), pp. 81–85.

the kidney is due to the development of a severe acid intoxication, rather than to irritant action of mercury itself.

Schamberg, Kolmer and Raiziss[7] who have also done considerable work on kidney injury due to the better known mercury compounds, report that mercury has a great affinity for the cells of the kidney, and that the nephritis produced by mercury is primarily tubular in variety. When given intravenously they report that mercury salicylate produces 100% severe tubular nephritis, the succinimide 71% and the bichloride but 25%.

The first experiments conducted were of a qualitative nature and were concerned only with the mercury excreted by the kidneys of animals injected with large doses of mercurosal since it was assumed that the kidney would be the chief organ of excretion and that the elimination would be comparatively rapid, due to the great solubility of the preparation.

The following table gives a brief summary of the results of the first series of experiments:

TABLE I.—PRELIMINARY QUALITATIVE SERIES.

Urine sample.	Dose of mercurosal.	Injected.	Sample collected after.	Hg. test.
No. 1	0.025 Gm.	Intravenously	1/2 Hour	Negative
No. 2	0.025 Gm.	Intravenously	6 Hours	Negative
No. 3	0.100 Gm.	Intramuscularly	5 Hours	Positive
No. 4	0.050 Gm.	Intramuscularly	1/2 Hour	Negative
No. 5	0.050 Gm.	Intravenously	1/4 Hour	Negative
No. 6	0.050 Gm.	Intramuscularly	4 Hours	Negative
No. 7	0.050 Gm.	Intravenously	4 Hours	Negative
No. 8	0.100 Gm.	Subcutaneously	4 Hours	Negative
No. 9	0.050 Gm.	Intramuscularly	4 1/2 Hours	Negative

These results indicate that mercurosal is not very rapidly eliminated by the kidney even following large doses intravenously. The one positive result was obtained five hours after a very large dose was administered intramuscularly.

QUANTITATIVE EXPERIMENTS.

In a preliminary quantitative experiment a normal, female dog, weighing 9.6 Kgs. was injected intravenously with 200 mgs. (approximately 20 mgs. per Kg. body weight) of mercurosal. A 2% solution was used, and injection of the 10 cc. was accomplished in five minutes.

The dog did not vomit but defecated once within ten minutes after injection of this very large dose. The dog was placed in a metabolism cage, and exactly 25 hours after injection was anesthetized and bled to death. The total urine and feces were collected (this included the contents of the bladder and the intestines at the time of death), and submitted for chemical assay. Also the blood, kidneys, lungs, and liver were submitted for tests. The reports showed 0.0263 Gm. mercury or 0.060 Gm. mercurosal in the urine; 0.0072 Gm. mercury or 0.016 Gm. mercurosal in the feces and very small amounts in the other organs submitted. The amounts in the urine and feces account for about 40% of the mercurosal injected.

In another preliminary experiment a dog weighing 13 Kgs. which received 800 mgs. of mercurosal intravenously in a period of four days (200 mgs. per day) excreted mercury corresponding to 120 mgs. of mercurosal in the urine during this

time. This was 15% of the total injected. The amount in the feces was lost in the chemical manipulation.

A third dog, weight 22 Kgs., received 1.25 Gms. (1250 mgs.) of mercurosal intravenously within a period of four weeks, and a total of 550 mgs. was recovered in the urine in the period which included one week after the last injection. This amounted to 44% of the total, and again the feces determination was a failure.

A fourth dog, weight 10 Kgs., was injected intramuscularly and intravenously with 500 mgs. of mercurosal in a period of three days. This dog died from the effect of this dosage. The urine during this period contained 86 mgs. or 17%, and the feces contained 93 mgs. or 19%.

These four preliminary quantitative experiments each bring out certain points relative to mercurosal elimination after intensive dosage. In the first experiment less than 40% of the mercurosal injected was present in the total feces and urine 25 hours later, showing the distribution of the remaining 60% throughout the body.

Experiments No. 2 and No. 4 show the relatively small amount which is eliminated by the kidneys within a few days after injection of large doses.

Experiment No. 3 shows the higher proportion which is eliminated by the kidneys over a much longer period.

Following this preliminary qualitative and quantitative work with mercurosal, a more complete series of experiments was begun on about ten dogs using mercuric chloride, mercurosal, mercury salicylate and mercury succinimide. Two dogs were used with each salt to act as duplicates and in the case of the bichloride four were used, because the dosage proved fatal too early in the first series of experiments. In every case, the largest possible dosage was used in order to aid the chemists in their attempts to find weighable amounts in each day's urine and feces.

The tables containing the detailed data obtained in each experiment follow:

TABLE II.—MERCURIC CHLORIDE INTRAVENOUSLY.

Dog no.	Dose and date.	Date of sample.	Hg. in urine.	Hg. in feces.
1	25 mgs. 8/14	8/14 to 15	0.0026 Gm.	None
1		8/15 to 16	0.0041 Gm.	0.0014 Gm.
1	25 mgs. 8/16	8/16 to 17	0.0020 Gm.	
1		8/17 to 18	0.0008 Gm.	
1		8/18 to 20	0.0021 Gm.	
	50 mgs.		0.0116 Gm.	0.0014 Gm.

This dog, weighing 17 Kgs., died at noon 8/20/23 from acute mercury poisoning (two doses of 1.5 mgs. per Kg. of mercuric chloride).

Dog no.	Dose and date.	Date of sample.	Hg. in urine.	Hg. in feces.
2	25 mgs. 8/14	8/14 to 15	0.002 Gm.	
2		8/15 to 16	None	0.0045 Gm.
2	25 mgs. 8/16	8/16 to 17	0.0035 Gm.	0.0009 Gm.
2		8/17 to 18	0.0147 Gm.	
2		8/18 to 20	0.0019 Gm.	
	50 mgs.		0.0203 Gm.	0.0054 Gm.

This dog, weighing 15 Kgs. died about 10 A.M. 8/20/23 from acute mercury poisoning (total dose of bichloride was 50 mgs. in five days).

In the experiment with dog No. 1 a total of 13.0 mgs. of mercury, corresponding to 17.6 mgs. of bichloride, was found in the urine and feces. This is 35% of the total amount injected, and was excreted within six days after the first injection. Since three of the feces samples were not successfully analyzed, this shows a relatively rapid rate of excretion. Dog No. 2 excreted the bichloride still more rapidly, since 25.7 mgs. mercury, corresponding to 34.8 of bichloride were excreted within six days after the first injection, and two feces assays were not made. The amount found in this case represents practically 70% of the total amount injected.

TABLE III.—MERCURIC CHLORIDE INTRAVENOUSLY—SECOND SERIES.

Dog no.	Dose and date.	Date of sample.	Hg. in urine.	Hg. in feces.
3	10 mgs. 9/13/23	9/13 to 14	0.0021 Gm.	
3		9/14 to 15	0.0008 Gm.	
3	10 mgs. 9/15	9/15 to 17	0.0032 Gm.	
3	10 mgs. 9/17	9/17 to 18	0.0036 Gm.	
3	10 mgs. 9/19	9/18 to 21		
3		9/21 to 22	0.0006 Gm.	
3	10 mgs. 9/22	9/22 to 24	0.0020 Gm.	0.0001
3	Sixth injection	9/24 to 26	0.0017	
	was not given	9/26 to 29		
	because both	9/29 to 30	0.0001 Gm.	
	femoral veins	9/30 to 10/3		
	were so badly	10/3 to 10/23	None	None
	necrosed			
	50 mgs.		14.1 mg.	

This dog, No. 3, weighing 13 Kgs. was rather seriously affected by this amount of bichloride, showing that a larger dose could not be given. Bloody diarrhoea and obliterated veins at the sites of injection resulted from this dosage.

In this experiment, 14.2 mgs. of mercury, corresponding to 19.2 mgs. of bichloride were recovered in the urine and feces. This amounted to 38% of the total injected. Since only two samples of feces were analyzed, partly due to inability to separate the liquid feces from the urine, practically all of the excretion is shown to be through the kidneys. Forty per cent of the total bichloride injected was recovered by analysis.

TABLE III (Continued).

Dog no.	Dose and date.	Date of sample.	Hg. in urine.	Hg. in feces.
4	15 mgs. 9/13	9/13 to 14	0.0034 Gm.	0.0015 Gm.
4	15 mgs. 9/15	9/14 to 21		
4	15 mgs. 9/17	9/21 to 23	0.0015 Gm.	0.0016 Gm.
4	15 mgs. 9/19	9/23 to 24	0.0100 Gm.	0.0008 Gm.
4	15 mgs. 9/22	9/25 to 26	0.0034	
4	15 mgs. 9/24	9/26 to 10/3		
4		10/3 to 23	0.0031 Gm.	0.0003 Gm.
	90 mgs.		0.0214 Gm.	0.0042 Gm.

This dog, No. 4, weighing 22 Kgs. was not so seriously affected by the larger dose as was dog No. 3. There was some diarrhoea, but the veins were not obliterated.

In this experiment, 25.6 mgs. of mercury, corresponding to 34.6 mgs. of bichloride were recovered in the urine and feces. This amounted to 38% of the total injected, and considering that analyses for two periods of one week each are missing

from the total period of observation of nearly six weeks, it is not surprising that more mercury was not recovered. Of the total amount recovered, 29 mgs. was excreted by the kidneys and this amounted to about 84%, while 16% was excreted by the intestinal tract.

TABLE IV.—MERCUROSAL INTRAVENOUSLY.

Dog no.	Dose and date.	Date of sample.	Hg. in urine.	Hg. in feces.
5	200 mgs. 7/23	7/23 to 24	0.01026 Gm.	0.0009 Gm.
5		7/24 to 25	0.0021 Gm.	
5	150 mgs. 7/25	7/25 to 26	0.0447 Gm.	0.0032 Gm.
5		7/26 to 27	0.0028 Gm.	0.0009 Gm.
5	150 mgs. 7/27	7/27 to 28	None	None
5		7/28 to 30	0.0064 Gm.	None
5		7/30 to 31	0.0220 Gm.	
5	150 mgs. 7/31	7/31 to 8/1	0.0344 Gm.	
5		8/1 to 2	0.0028 Gm.	None
5		8/2 to 3	0.0184 Gm.	0.0005 Gm.
5	150 mgs. 8/3	8/3 to 4	0.0076 Gm.	
	800 mgs.		0.15146 Gm.	0.0055 Gm.

Kidney contained 0.006 Gm.

This dog, weighing 13 Kgs., died on the night of August 3 from the effects of the 800 mgs. of mercurosal. The vein at the site of injection was in good condition.

In this experiment, 151.46 mgs. of mercury, corresponding to 344 mgs. of mercurosal, were excreted by the kidneys. This is 43% of the total amount injected.

Only 5.5 mgs. of mercury, corresponding to 12.5 mgs. of mercurosal, were found in the feces and this was 1.5% of the total injected. The kidneys excreted 96% of the total excreted.

Gross and histological examination of this dog's kidney showed no abnormalities.

TABLE IV (Continued).

Dog no.	Dose and date.	Date of sample.	Hg. in urine.	Hg. in feces.
6	200 mgs. 7/23	7/23 to 24	0.0341 Gm.	0.0026 Gm.
6		7/24 to 25	0.0061 Gm.	0.0141 Gm.
6	200 mgs. 7/25	7/25 to 26	0.0693 Gm.	0.0025 Gm.
6		7/26 to 27	0.0018 Gm.	None
6	200 mgs. 7/27	7/27 to 28	None	
6		7/28 to 30	0.0552 Gm.	0.0047 Gm.
6	200 mgs. 7/30	7/30 to 31	0.0140 Gm.	None
6	200 mgs. 7/31	7/31 to 8/1	0.0139 Gm.	0.0020 Gm.
6		8/1 to 2	0.0016 Gm.	
6	200 mgs. 8/3	8/2 to 3	0.0803 Gm.	0.0003 Gm.
6		8/3 to 13	None	None
	1200 mgs.		0.2763 Gm.	0.0262 Gm.

This dog, weighing 17 Kgs., was in fairly good condition about two weeks after the last dose was injected. A total of 276.3 mgs. metallic mercury, corresponding to 628 mgs. mercurosal, was found in the urine. This was 52% of the total amount injected. Only 26.2 mgs., corresponding to 60 mgs. mercurosal, were found in the feces. Two feces samples were not successfully analyzed, but these would

not have added much to the total. The amount found in the feces was 5% of the total injected. The kidneys excreted 91% of the total excreted in the urine and feces.

TABLE V.—MERCURY SALICYLATE, INTRAVENOUSLY.

Dog no.	Dose and date.	Date of sample.	Hg. in urine.	Hg. in feces.
7	25 mgs. 8/21	8/20 to 21	None	None
7		8/21 to 22	0.0017 Gm.	None
7	15 mgs. 8/23	8/22 to 23	0.0009 Gm.	None
7		8/23 to 24	0.0078 Gm.	None
7	15 mgs. 8/25	8/24 to 25	None	None
7		8/25 to 27	0.0085 Gm.	None
7	20 mgs. 8/27	8/27 to 28	None	0.0016 Gm.
7		8/28 to 29	None	None
7	20 mgs. 8/29	8/29 to 30	None	0.0027 Gm.
7		8/30 to 31	0.0043 Gm.	0.0006 Gm.
7		8/31 ot 9/1	0.0026 Gm.	None
7		9/1 to 5	None	None
7		9/5 to 7		0.0033 Gm.
7		9/7 to 10	None	
	95 mgs.		0.0258 Gm.	0.0082 Gm.

This dog, weighing 12 Kgs., given a total of 95 mgs., excreted 25.8 mgs. of metallic mercury, corresponding to 43.7 mgs. of salicylate, in the urine. This was 46% of the total injected. Eight and two tenths mgs. of metallic mercury, corresponding to 13.7 mgs. of salicylate, were excreted in the feces and this was 14.4% of the total injected. Altogether about 60% of the total injected was recovered in the urine and feces, and 75% of this was excreted by the kidney.

TABLE V (Continued).

Dog no.	Dose and date.	Date of sample.	Hg. in urine.	Hg. in feces.
8	25 mgs. 8/21	8/21 to 22	0.0004 Gm.	No sample
8		8/22 to 23	None	0.0030 Gm.
8	25 mgs. 8/23	8/23 to 24	No Sample	No sample
8		8/24 to 25	No sample	0.0016 Gm.
8	25 mgs. 8/25	8/25 to 27	0.0020 Gm.	0.0001 Gm.
8	25 mgs. 8/27	8/27 to 28	0.0067 Gm.	None
8		8/28 to 30	0.0029 Gm.	No sample
8	25 mgs. 8/29	8/30 to 9/1	0.0041 Gm.	None
8		9/1 to 5	None	None
8		9/5 to 7	0.0017 Gm.	0.0028 Gm.
8		9/7 to 10	0.0035 Gm.	0.0004 Gm.
	125 mgs.		0.0223 Gm.	0.0079 Gm.

This dog, weighing 22 Kgs., and given a total of 125 mgs. of mercury salicylate, excreted 22.3 mgs. in the urine. This was 30% of the total injected. Seven and nine tenths mgs., corresponding to 13.2 mgs. of salicylate, were excreted in the feces and this was 10.5% of the total injected. In this experiment, only about 40% of the total injected was recovered in the urine and feces, but here, as with dog No. 7, 75% of the total recovered was excreted by the kidneys.

TABLE VI.—MERCURY SUCCINIMIDE INTRAVENOUSLY.

Dog no.	Dose and date.	Date of sample.	Hg. in urine.	Hg. in feces.
9	22 mgs. 10/8	10/9 to 10		0.0015 Gm.
9	22 mgs. 10/10	10/10 to 11	0.0016 Gm.	0.0013 Gm.
9		10/11 to 12	0.0017 Gm.	0.0038 Gm.
9	22 mgs. 10/12	10/12 to 15	0.0001 Gm.	0.0017 Gm.
9	22 mgs. 10/15	10/15 to 16	0.0036 Gm.	0.0030 Gm.
9		10/17 to 19	0.0030 Gm.	0.0014 Gm.
9		10/19 to 20	0.0042 Gm.	
9		10/20 to 23	0.0020 Gm.	0.0027 Gm.
9		10/23 to 24		0.0013 Gm.
9		10/24 to 25	0.0030 Gm.	
9		10/25 to 26	0.0052 Gm.	0.0016 Gm.
	88 mgs.		0.0244 Gm.	0.0183 Gm.

This dog weighing 25 Kgs. stood the treatment very well, and was in good condition two weeks after the injection ceased. A total of 88 mgs. of mercury succinimide were injected into this dog, and 42.7 mgs. of mercury, corresponding to 83.7 mgs. of succinimide, were recovered in the urine and feces. This was 95% of the total injected and shows how rapidly and completely the succinimide is eliminated when administered intravenously. Fifty-seven per cent of the total recovered by analysis was excreted by the kidneys, and the remaining 43% by the intestinal route.

TABLE VI (Continued).

Dog no.	Dose and date.	Date of sample.	Hg. in urine.	Hg. in. feces.
10	22 mgs. 10/8	10/9 to 10	0.0029 Gm.	0.0007 Gm.
10	22 mgs. 10/10	10/10 to 11	0.0032 Gm.	0.0010 Gm.
10		10/11 to 12	0.0015 Gm.	0.0018 Gm.
10	22 mgs. 10/12	10/12 to 13		0.0009 Gm.
10		10/13 to 15	0.0062 Gm.	0.0015 Gm.
10	22 mgs. 10/15	10/15 to 16	0.0020 Gm.	0.0010 Gm.
10	22 mgs. 10/17	10/16 to 19	0.0027 Gm.	0.0016 Gm.
10		10/19 to 20	0.0022 Gm.	0.0010 Gm.
10		10/20 to 22	0.0022 Gm.	0.0006 Gm.
10		10/22 to 23	0.0019 Gm.	0.0042 Gm.
10		10/23 to 24	0.0017 Gm.	0.0021 Gm.
10		10/24 to 25	0.0019 Gm.	0.0045 Gm.
10		10/25 to 26	0.0040 Gm.	0.0004 Gm.
	110 mgs.		0.0324 Gm.	0.0213 Gm.

This dog, weighing 22 Kgs., received a total of 110 mgs., but the last two injections were made intramuscularly. The animal showed no evidence of a very marked reaction. A total of 0.0537 Gm. of mercury, corresponding to 0.105 Gm. was recovered by analysis from the urine and feces during a period lasting about 10 days after the last injection. This amounted to 95% of the total injected, and checks up with the other experiment with succinimide. Both these results must be a little high as the excretion would hardly be so complete in each case. Sixty per cent of the total recovered was excreted by the kidneys and 40% by the intestines.

CONCLUSIONS FROM EXPERIMENTAL DATA.

1. In the series of qualitative tests, no mercury was found in the urine six hours after the intravenous injection of a dose of 25 mgs. of mercurosal, showing that its elimination by the kidneys is not extremely rapid.

2. In one of the preliminary quantitative experiments, the total feces and urine excreted during a 25-hour period immediately following the injection of a single large dose of mercurosal were collected at autopsy. The mercury recovered by analysis amounted to 40% of the total injected, showing the distribution of the remaining 60% throughout the body.

3. In two other preliminary quantitative experiments, massive doses of mercurosal were injected, during a period of three and four days respectively, and the total excreted in the urine during these periods was 17% and 15%. This shows a reasonably slow excretion which permits the action of the drug and yet the excretion is rapid enough to prevent a serious cumulative action.

4. In the four quantitative experiments with the bichloride, the corrosive and systemic effects were very evident even with the smaller dosage. In all the four experiments, the rapidity of excretion by the kidneys was evident and in the two experiments where a few chemical analyses of feces samples were completed, it was apparent that not more than 20% of the total mercury eliminated would be by the intestines.

5. In the two quantitative experiments with mercurosal, the data obtained showed a total elimination of 43% and 52%. In each experiment, the kidneys excreted about 95% of the total. This indicates that mercurosal is very largely excreted by the kidneys. Also it is excreted rapidly enough to prevent any serious cumulative action from ordinary dosage. In several instances it was found by histological examination that mercurosal had no appreciable irritant action on the kidneys of animals but further studies would be necessary to prove definitely that the effect on the epithelial cells is negligible.

6. In the experiments with mercury salicylate intravenously, the mercury was eliminated fairly rapidly and in each case 75% of the total recovered by analysis was found in the urine. This shows that it corresponds more nearly with the bichloride in the nature of its elimination than with mercurosal. The kidney injury caused by the excretion of mercury salicylate is severe and is strongly emphasized by Schamberg.[7]

7. In the experiments with mercury succinimide, the rapidity and completeness of the excretion of the mercury is very noteworthy and also the fact that fully 40% of the total recovered was found in the feces. The succinimide shows the greatest percentage excreted by the intestines of any of the salts tested with the bichloride and salicylate next with about 25% intestinal excretion and mercurosal last with about 5%.

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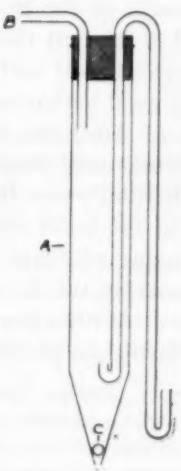
AN AUTOMATIC "NONBREAKING" SYPHON.

BY E. O. EATON.*

An apparatus in a single unit is needed which will start a syphon without the use of mechanical suction and which will not "break" as the level of the short arm is reached. Such an apparatus would prove particularly useful in syphoning acids, alkalis, and other corrosive and poisonous liquids from bottles, carboys, etc., and also in obtaining a certain maximum volume while maintaining a constant level, as is necessary in certain types of percolations, filtrations, etc. The accompanying drawing shows such an apparatus.



The process is started by immersing the short arm jacket "A" to about one-third of its depth in the liquid to be syphoned. By gentle suction at "B" the jacket is partially filled. Pressure at "B" then closes the outlet with the glass bead "C" and forces the liquid through the syphon, thereby filling it. The syphon is kept from "breaking" by the turned-up ends of the syphon arms.

THE PREPARATION OF HERBARIUM MATERIAL AND ITS RELATION TO PHARMACY.**

BY CHARLES E. SMYTHE.[1]

As over 70 per cent of our medicinal agents are of vegetable origin, it can readily be understood that botany should play an important part in the study of pharmacy. The preparation of herbarium material by students is an essential part

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in our curriculum at the College of Pharmacy, University of Minnesota. In the first quarter of the junior year, we assign to every student the preparation of an herbarium of about seventy specimens. These specimens consist mainly of medicinal plants which they identify, mount and label, materials being provided for that purpose. The object, of course, is that students may learn to know medicinal plants as they grow in nature; to know the leaf, the flower, root and stem—in fact, to know the plant as a whole, and not merely one of its parts, such as root, or leaf, or whatever part happens to be used in medicine.

There is an art in the preparation of an herbarium.[1] To make a good herbarium, the leaves or flowers should, generally, be collected in the summer, when they are at maturity. In the fall they are apt to be old, and will not press as well, or show such good color. There are some exceptions to this rule, of course, such as Phytolacca (Poke) or varieties of Rhus, which show more beautiful coloration in the fall.

Specimens should not be collected on a rainy day, nor when the dew is still on the plant, for the great amount of moisture will make drying difficult, and mould easily develops. After collecting, the specimens are to be spread immediately on blotters or newspapers and flattened out carefully, taking care especially of the margins of the leaves; weights for pressure should be applied evenly. For the first three or four days, the blotters should be changed daily for dry ones, taking care each time that the specimens are perfectly flat. This is the secret of a good herbarium, and there is no other way that yields such uniform results.

After the first week, it will usually suffice to change blotters only twice a week until thoroughly dry. The specimens are then mounted on standard herbarium paper by means of glue or strips of gummed material. Labels are placed on the lower right-hand corner of the sheet, with such information as: Botanical name of Plant; Common Name; Family; Habitat; When Collected; Where and by Whom, and any other information which might be useful.

Within ten miles of the Twin Cities we have collected something over forty medicinal plants yielding U. S. P. or N. F. Drugs. Their names follow:

Senega, leptandra, cypripedium, cicuta, iris versicolor, angelica, actæa, aralia racemosa, aralia nudicaulis, caulophyllum, trillium, arisæma, asarum, geranium, sanguinaria, aquilegia, typha, erigeron, eupatorium purpurea, eupatorium perfoliatum, prunus serotina, valeriana edulis, rumex, polygonatum, heuchera, menispermum, achillea, sarracenia, osmunda, adiantum, smilacena, senecio, melilotus, allium, calamus, celastrus, apocynum, penstamon, caltha, xanthoxyllum.

In almost any locality there may be found some medicinal plants growing in their native habitat. Here is an opportunity, especially for the country pharmacist, to place himself on a professional standing with the public. The pharmacist should be the botanical enthusiast of his locality. It would be interesting and instructive for the pharmacist to make up a collection of the medicinal plants of his neighborhood and exhibit them in his store. In case of doubt as to the identity of plants, the Botany Department, or the College of Pharmacy, University of Minnesota, are always glad to be of assistance. A great many medicinal plants are grown in the Medicinal Plant Garden, and seeing them aids in the identification of others.

[1] Herbarium specimens, made under ideal conditions, were exhibited—these retained the natural colors of flowers, leaves, etc.

Collections of herbarium specimens are of value in many directions. Primarily, they are of use in aiding the identification of unknown plants or economic vegetable products, such as drugs. The pharmacist should know especially the poisonous plants of his locality, their poisonous properties and antidotes, so as to be able to give prompt aid in the absence of a physician in emergency cases. This alone will compensate him for any trouble he may take to familiarize himself with these plants, and will enhance his reputation in the community. Every year in Minnesota there are deaths among children, resulting from eating the very poisonous tubes of Cicuta maculata. Every pharmacist should know this plant at a glance. The logical man to give information of this kind is the pharmacist, and he cannot be too well informed on these points.

The acquirement of knowledge for its own sake is a worthy object. Acquirement of knowledge for pecuniary advantage is often necessary; but the acquirement of knowledge for the service of others is the noblest object of all, and will repay a thousand-fold. There is more in life than money. There is more in pharmacy than the dollar. It is only by unselfish service that pharmacy again will assert itself as an ancient and honorable profession.

The pharmacist in these days cannot afford to ignore any method whereby his professional standing might be augmented, and it is his duty so to do whenever possible. We suggest here one avenue toward this end.

ABSTRACT OF DISCUSSION.

H. O. Tiegen: (Moorhead): This paper speaks for itself, and also the specimens which we have seen; they are the finest specimens I have ever seen and to teach others to do such work is worth while. In our community, frequently, people bring in plants for identification. Unfortunately, I have not had thorough training in botany, but with the aid of a botanist at one of our colleges, the information is usually supplied.

At a Kiwanis meeting in our home town a year ago, a physician spoke on Child Welfare Work and Public Health. In the course of his remarks, he referred to the work of physicians and nurses for the community, without a word relative to what the pharmacists were doing. It set me to thinking. I knew of the activities in which we were taking part and of the information we were giving to our customers.

After the meeting, I told him that he overlooked one very essential point in his discussion; that he had not given pharmacists any credit whatsoever for health work for the dissemination of information relative to the health of the community and the prevention of disease. I told him, that in my opinion pharmacists, in the course of their activities, disseminated more information than the medical and dental professions put together, and I believe the facts will bear me out.

It set me to thinking: "What am I doing in my community for the betterment of the public?" Pardon me for speaking of myself: In our town there is a hospital operated by the Franciscan Sisters. They wanted to know if I would help instruct the girls in their studying materia medica. I thought the matter over. At first I was reluctant to take on that extra work. It takes one of my afternoons. After hearing the talk referred to, I thought it was my duty to accept the opportunity. I find it has more than repaid me in the professional standing given me in my community.

There is opportunity for the pharmacists of the United States to take on this kind of work or related work especially in hospitals in the country, where they have no registered pharmacist.

There is also an opportunity to disseminate information relative to the preparations of the U. S. P. and N. F. I have made inquiries among nurses and the girls in training, and find most of them are not familiar with our U. S. P. and N. F. preparations. I asked about thirty nurses why they asked for certain proprietary preparations of the U. S. P. and N. F. The reply of every one of those young women was that they thought the preparations were identical—that these trade names were synonyms. They also objected to the long official names. In my opinion

shorter names should be given official preparations, which could not be copy-righted by manufacturers.

Such publicity work can be enlarged upon according to the inclination of the individual. It need not be confined to instruction in hospitals. We read in the papers of a doctor or a veterinary surgeon or a dentist addressing a mothers' club or a farmers' club on different subjects. In my opinion, there is no field in which there is greater opportunity for romance and interesting stories than in subjects related to the drug business. Considering the materials used in medicine, we have much to draw from, and we can follow lines which interest us most.

I can see possibilities for talks to mothers' clubs on foods, on flavoring extracts, and many other subjects in which the housewife is interested. Pharmacists should take a larger interest in the welfare of the community—it will repay in the professional standing which it will create.

Chairman F. J. Wulling: This is a helpful communication, and I hope the advice given will be followed. It is true the pharmacists of to-day, taken as a whole, are following the direction of least resistance which leads into commercialism, and not developing the opportunities of their calling.

I might say in corroboration of one of the recommendations made, that a number of years ago the University of Minnesota put on "University Weeks," sending lecturers over the country. I was called upon to give such service, and spent two weeks lecturing to people of the smaller towns on matters suggested by Mr. Tiegen. We took up the relation of the pharmacist to the public and showed in how many ways the pharmacist can help the people. The idea grows upon me as I think about it. I want to stimulate the thought Mr. Tiegen has given us on that score. We can do more then we are doing in our respective communities. There are not enough pharmacists on health boards; not enough who are lecturers; not enough who are in the legislature, etc. By virtue of the professional and business training the pharmacists, they should be much more active in their respective communities.

E. L. Newcomb: I should like to add to Mr. Smyithe's paper in line with what Mr. Tiegen said. There is unquestionably an opportunity for very greatly extending our efforts along the lines indicated by this particular paper. The minute you begin to talk about publicity work, you can think of all sorts of things to be done to help the pharmacist, and also the public.

This paper suggests publicity work along one or two lines. Since I have been in Minnesota—fourteen years—at least eight children died from eating so-called "poison parsley." An excellent thing that might be done is to prepare a beautifully colored picture of this plant showing the tuberous root, which has a pleasant taste, and post such bulletins in drug stores, possibly with a little statement about the plant which might be published through the coöperation of the local editor with the pharmacists.

There are many deaths due to the eating of poisonous mushrooms. A bulletin illustrating some of the poisonous mushrooms would be a splendid thing to display in drug stores, to call attention to the difference in appearance between poisonous and edible mushrooms, and to inform the public relative to plants of this kind. This, again, is simply in line with the suggestion that the pharmacist should be the informant of the neighborhood on these matters. There are many opportunities for him to increase his prestige and standing in work of this kind.

UNFIT CONTAINERS AND CARELESS LABELING.

BY LEWIS ELLSWORTH JARRETT.

Much has been written and said regarding the mislabeling of drugs; numerous laws have been enacted governing such wrongful acts; yet, some pharmacists seem to be lax enough to allow such procedure in their stores and are themselves among the offenders. Education and experience should impress the importance of care in such matters, which may result in injury and destruction of human life. Failure to place the alcoholic strength on the label of some preparations, or omission of more or less non-essential statements, may be pardoned, but to mislabel a poison, or dispense it in a container whereby life may be endan-

gered—is reprehensible, violates laws and pharmaceutical ethics. Nevertheless, it is surprising how many cases of poisoning occur, due to the mislabeling of poisons, the misunderstanding of purchasers relative to the danger in the use of some of them, and the disregard of precautions which should be observed in handling poisons.

The writer is a Hospital Pharmacist in an institution that treated over two hundred cases of poisoning last year; he is in a position where he sees a large number of those admitted for treatments, and herewith submits a report of a violation of poison regulations that occurred recently.

A few weeks ago a patient was brought to the hospital, and the Ambulance Surgeon gave the history of the patient as being "drunk." The man was found in an unconscious condition and, after failing to respond to the usual treatment for such cases, was brought to the hospital. In the man's pocket was found a bottle labeled "Denatured Alcohol." Of course, he was treated for Denatured Alcohol poisoning and, after remaining in the hospital for sixteen days, was discharged, apparently cured. Before leaving, he told of drinking the contents of a bottle of Denatured Alcohol (he did not remember the size of the bottle) and half of that in the bottle found in his pocket. The bottle was properly labeled "Denatured Alcohol" with the word "Poison" and an antidote was clearly stated, but the container was an old ginger ale bottle with the name of a popular brand in raised glass letters in two places on the bottle. The label insured safety as long as the bottle remained in the proper hands and the "Poison Label" on the bottle. However, as an example, a child finding this bottle of deadly poison, after the label had been mutilated, might be tempted to drink the contents of the bottle because the raised letters indicate "Ginger Ale;" the result would be injury to, or the death of, an innocent person.

Denatured Alcohol can be purchased at "auto-filling" stations and elsewhere without a label of any kind. This should not be permitted but certainly pharmacists should not be guilty of careless labeling nor should they use containers which might, after the label is destroyed, misrepresent the contents. All poison regulations should be closely observed and poisons should not be dispensed in containers that may mislead, in case the attached label becomes defective.

School of Pharmacy,
Medical College of Virginia,
Richmond, Va.

SHIPMENT OF 14 MILLION QUININE TABLETS.

Probably the largest drug shipment ever to leave an American port, consisting of 14,000,000 five-grain quinine tablets, is on its way to Greece. There it will be used to combat the scourge of malaria existing in the great refugee camps of that country. February 20, the national headquarters of the American Red Cross appropriated $85,000 for the purchase of this record shipment. It is the last of a series of shipments made by the Red Cross to relieve widespread malaria outbreaks in the congested refugee camp.

The repatriation of nearly 1,000,000 Greek nationals from Asia Minor unavoidably resulted in many of these being quartered in malaria country. The result was a scourge as dreaded as that of typhus. The liberal distribution of the quinine shipments of the American Red Cross has, according to the Greek Department of Hygiene, saved the lives of tens of thousands of the refugees and enabled countless others, who otherwise would have been unable to work, to reëstablish themselves in their new homes.

THE DEPARTMENT OF THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES

THE TYRANNY OF A STANDARDIZED COURSE OF STUDY.

BY C. B. JORDAN.*

Our courses of study are based upon the assumption that all students "are created free and equal." This assumption is true in legal practice, but any one who has had experience in educational work knows that it is false in the second particular. All students are not created "equal" in mental ability, and the sooner educational institutions recognize this fact and treat them according to their ability, the better for the students and all others concerned.

Our high schools are not turning out a standardized product, and it is well that this is so. If it were true, we would suffer for lack of leadership. The colleges must take this unstandardized crowd and put them through a course of study that will fit them for citizenship and the special professional duties of their state in life. Can this be done with justice to all, if they are all put through the same educational mill? Is it well that all should come from this mill in equal condition of fineness and polish? What are we doing to assist the brighter students to come up to their possibilities? What are we doing to help the duller ones to prepare for a life of usefulness? Does a standardized course of study, based upon the mental ability of the "average" student, best fit all of our graduates for life's work?

In a class of fifty students there are from one to five outstanding mentalities and a similar or even greater number of the under-average. The pace set is based upon the average ability of the class. The outstanding and under-average are victims of this system.

The student of superior ability soon loses interest in work that is repeated several times in order to impress it upon the minds of students of less ability. As a result, the superior student is not inspired to do his best work and usually falls to the class average. If he is of the right sort, he may use his spare time in college activities, such as athletics, journalistic efforts, class offices, etc. These activities usually give him good training and, in a measure, compensate for the lack of inspiration in doing "average" work. Not all, however, are inclined to take up such activities, and these suffer from the "tyranny of the standardized course."

It is the duty of the institution to develop these superior students, for from them come the leaders of the future. How can this best be done? One or two methods suggest themselves to me, and I shall offer them for discussion:

First: These students could be encouraged to carry extra subjects and complete their course in less than the time allotted to it. This method has its difficulties. Schedules cannot be conveniently arranged to make suitable assignments. The sequence of the work often precludes certain assignments and limits the available courses. If the student does complete his course in a shorter period, he may be handicapped by state laws of licensure, which again are based upon the

* Dean of Purdue School of Pharmacy.

assumption that there is an "average" that all pharmacy students may be reduced to.

Second: The institution may establish "honor courses." This plan is not very well developed as yet. It requires especially capable teachers if it is to be successful. I believe it should not be tried unless the institution has excellent facilities and teachers adapted to such courses.

Third: The superior student could, after the freshman year, be induced to take extra courses that do not count toward the degree but that do broaden him and prepare him better for his life's work. In his junior and senior years he could be induced to take up some line of research under the direct supervision of his professors. This latter work would teach him methods of research and open to him the vast field of original work. In pharmacy this field is almost untouched, and the need of research workers is very great indeed. If the superior student had a taste of research work before graduating and were instructed in methods used, it might start him on the road of original work that would benefit humanity as well as his chosen profession. A certain percentage of these students would continue their research, and pharmacy would be the gainer thereby. I am inclined to favor this latter method.

I am convinced that institutions owe a duty to these superior students, and, until they recognize and fulfill this duty, there will continue to be waste from our educational mills. The hard-headed practical man, who did not have the opportunity to attend a college, criticizes the length of time spent in college and the lack of originality among our graduates. There is some basis for this criticism. It would be removed, in part at least, if our colleges inspired the superior student to accomplish all that his capabilities indicated.

What of the students of less than average ability? Should they have special treatment also? If they are assigned the regular load, and especially if the percentage of under-average students is large, the instructor is bound to slacken the pace to one that meets their capabilities, thus doing a grave injustice to the other students. What then can be done to relieve the class of these millstones? The following methods suggest themselves:

First: Divide the class according to the capabilities of the students and accomplish more work with the brighter section in the same length of time. This method has its practical difficulties. If the class is sectioned, it doubles the work of the instructor and may add to the expense by necessitating more instructors. Again, the laws governing pharmacy demand a certain standard of competence, and the slower section might not meet this standard.

Second: Set a pace that will cover the required ground and eliminate the under-average students. This is the method followed in many of our educational institutions. It has its weak points. Many of these under-average students may have good minds that are as yet undeveloped, or they have not yet learned how to apply themselves. Many students who fail in part of their work during the first semester of the freshman year tell me that they have not learned how to study before entering college. Several of these have recovered themselves, have graduated and are a credit to the institution and their community. Of course, there are bound to be some who will never be able to complete the work, but this waste from the educational mill should be very carefully sifted before discarding, or real injury may be done some students and also the profession.

Third: Determine the under-average students as early as possible; lighten their load and have them concentrate upon what remains. This may necessitate a longer period to complete the course, but that is better than ruthlessly eliminating all the under-average, as it gives opportunity to save to pharmacy and to themselves those that are worth saving. The beginning students need the most attention, and their instructors should be the most experienced ones in the institution. If you have a young instructor you wish to turn loose, try him on the experienced students, but save your best for the beginner. The beginners need wise, humane, experienced instructors, or much good material may be lost.

It is necessary to have a standard course of instruction, but, in administering it, attention should be given to the student of under-average ability and to the student of superior ability, or they will be victims of the "Tyranny of a Standardized Course."

THE COMMONWEALTH STUDY OF PHARMACEUTICAL EDUCATION.

BULLETIN NO. 5.

This is the fifth of a series of twelve monthly statements to be issued by the staff conducting this study to acquaint the profession with the progress of the study.

There has been such a general request from both the publishers and readers of previous bulletins, for some of the results of the study rather than methods employed, that it was decided to include in this bulletin some general observations resulting from the survey of retail stores which was conducted last summer.

It was determined early in the study that much of the information needed to complete a report on "what knowledge, skill and ideals a pharmacist should possess" must of necessity come from the retail pharmacist. It was therefore decided to make a survey of one hundred retail stores in each of the following centers and surrounding territories.

Boston, Mass.	Columbus, Ohio	New Orleans, La.
Richmond, Va.	Chicago, Ill.	Norman, Okla.
Philadelphia, Pa.	Minneapolis, Minn.	Los Angeles, Calif.
Pittsburgh, Pa.	St. Louis, Mo.	Seattle, Wash.
Greater New York	Lincoln, Neb.	Salt Lake City, Utah
	Buffalo, N. Y.	

Over 1100 Stores were surveyed for the following information:

1. How frequently and under what conditions the pharmacist is called upon to use some knowledge of toxicology.
2. The extent to which the retail pharmacist is doing his own manufacturing.
3. How many crude drugs are handled in bulk by the present-day pharmacist.
4. How well equipped the average store is to manufacture and compound.
5. How much attention the retailer is paying to U. S. P. and N. F. methods of preservation.
6. How frequently the pharmacist is called upon to render first aid and the conditions treated.

7. How much chemical assaying the pharmacist is doing.

8. How much biological assaying the pharmacist is doing.

9. How many retail stores are equipped to do bacteriological and clinical work.

10. The type of training the pharmacist interviewed has received.

11. With what pharmaceutical organizations he is affiliated.

12. The degree to which he is coöperating in matters pertaining to public health.

The final report when published will give statistical details that cannot be published at this time. General indications as drawn from the summaries submitted by those who actually interviewed the retailers were as follows:

1. The number of times that the pharmacist is called upon to actually treat a case of poisoning is limited. He very frequently uses his knowledge of toxic doses to catch what might have been serious errors in prescriptions.

2. Retailers to-day are doing little manufacturing.

3. The number of crude drugs sold from open packages is decreasing, but the number is still surprisingly large in many of the stores.

4. The average drug store is fairly well equipped to do compounding, but very few are equipped to do much manufacturing.

5. The average pharmacist is paying very little attention to official methods of preservation.

6. Most pharmacists are practicing first aid and believe it should be included in the college curriculum.

7. Retail pharmacists are doing no chemical assaying.

8. Retail pharmacists are doing no biological assaying.

9. A very limited number of retail drug stores are equipped to do bacteriological or clinical work.

10. Of the stores surveyed about one-half were operated by a pharmacist possessing at least a Ph.G. degree or its equivalent.

11. The retail pharmacists are not taking the interest in organization work that they should.

12. In few instances are pharmacists taking their places beside the physician in matters of sanitation and public health.

As can readily be seen much of the above is negative. The final report of the committee will carry practical suggestions as to methods of correcting many of the above conditions which are tending to divorce pharmacy from its proper professional standing.

PLACE OF PREVENTIVE MEDICINE IN CURRICULUM.

And now the whole medical curriculum has been revised with the definite object of permeating the entire period of study by the principle of prevention; every subject, from applied physics, chemistry, biology and anatomy, up to the clinical courses, is to be taught with a view to the maintenance of health as well as the cure of the disease. The teachers themselves will, perhaps, have to develop a new orientation, and the outdoor department or dispensary will often be a better field for instruction than the hospital ward.—J. C. McVail, *Proc. Roy. Soc. Med.*, 18, 8 (Dec. 1924). Through *Jour. A. M. A.*, Feb. 7, 1925.

THE CONDITIONS OF PHARMACY IN PERU.

Professor Angel Maldonado of the Institute of Pharmacy of the University of Lima, Peru, addressed the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION at its March meeting. After being introduced by Dean H. H. Rusby, Professor Maldonado thanked the members for the courtesies that had been extended to him and to Peruvian pharmacists by those of the United States. He said that Professor Rusby was held in high regard as a scientist and friend in Peru. He extended felicitations of the Peruvian pharmacists and expressed himself favorably relative to Dr. Rusby's idea of establishing branches of the AMERICAN PHARMACEUTICAL ASSOCIATION in South American countries. He was pleased and appreciated fully the opportunity of meeting American pharmacists, and he hoped that the friendship which now existed between this country and those of South America would be strengthened, and coöperatively the medicinal plants of Peru and other countries would be studied even more extensively than up to the present time.

After these preliminary remarks, Professor Maldonado spoke of the conditions of pharmacy in Peru, and abstracts of his address follow:

"Pharmacy is taught at the Institute of Pharmacy of the University of San Marcos at Lima, and the requirements for admission are certificates of five years of successful study in a preliminary school, and five years in advanced studies, followed by a special examination for admission before three members of the faculty. The course of study extends over a period of four years, and the subjects are, among others, physics, botany, microscopy, zoölogy, chemistry in its various branches, bacteriology, galenical pharmacy, materia medica, etc. The candidates must also certify that they have practiced in a pharmacy for at least six months.

"The examinations at the end of the year are given under similar conditions, and for a diploma the candidates must undergo theoretical and practical examinations involving the various subjects of the curriculum. A thesis must also be presented. The title given is that of 'Pharmacist,' and the diploma authorizes the person to practice pharmacy anywhere in Peru.

"A pharmacy in Peru is a place for the preparation and sale of medicines and their manufacture, and these establishments are authorized to sell only medicinal preparations, household remedies, and such items as are necessary in the prevention and alleviation of disease. These pharmacies must keep in stock the items which are designated on an official list. A pharmacist must be in charge at all times. Prescriptions are not returned to the public, and must be kept on file by the pharmacist, and copies of these prescriptions must also be made and preserved in a book for the purpose. The metric system is used, and the French Pharmacopœia is officially recognized.

"By 'drug store,' in Peru, is meant an establishment importing or dealing in drugs, chemicals, etc. They supply the pharmacies, and do not sell directly to the public. There are Chinese herb stores that sell to the Asiatic inhabitants. There are also Peruvian herb stores which supply the demands of the natives.

"Regulations are provided for these various establishments; those for the pharmacies are very strict. The Inspecting Committee of Pharmacies must visit all of these establishments at least once during the year (January) and make a careful examination, and if the examination is satisfactory a report to that effect is

left in the store and placed on record. If the examination is not satisfactory the pharmacist is warned, and in extreme cases the establishment is closed. There are regulations applying to the sale of poisons, and of narcotics, and also of other medicinal preparations.

"In every province or state there is a pharmaceutical society, and the one in Lima is known as 'The Federation of Peruvian Pharmacists' because it represents all the pharmacists of the country. The official publication is *The Pharmaceutical Bulletin*."

"Quite a number of pharmacists," the speaker stated, "are interested in research work, and the desire of Peruvian pharmacists is to advance the profession of pharmacy and improve pharmaceutical education. They expect to establish a department of pharmacy at the University so that pharmacists may qualify for a degree."

In concluding the speaker again thanked the several institutions, laboratories, and pharmacists generally, for the courtesies that had been extended to him.

THE PHARMACIST AS WE KNOW HIM.

The educated pharmacist, as we know him to-day, very probably looks on any such violation (counter-prescribing) of his profession as stultifying and beneath him. His professional associations and his organizations have brought the ethics of pharmacy to the front, and accomplished a splendid work in demonstrating that the practice of pharmacy is indeed a learned and dignified profession, and not merely the pursuit of a business calling. And in exalting the professional and scientific character of pharmacy, the druggist's organizations have not only taught him the deepest respect for his work but shown him that he owed it to himself, and to his standing as a pharmacist, not to encroach on medical practice, or to violate the ethics of the pharmaceutical profession.

Too great praise cannot be given to the admirable code of ethics which has been adopted by the AMERICAN PHARMACEUTICAL ASSOCIATION. No one can read these principles of ethics without recognizing the important place pharmacy occupies to-day in the promotion of human welfare. The promulgation of this code of ethics, and the widespread dissemination among the people of the slogan, "Your druggist is more than a merchant," have accomplished a great deal, not only in establishing the true status of the pharmacist in this country, but in placing pharmacy on a plane of scientific service and efficiency that deserves the hearty approbation of every thinking person.

Especially is this elevation of pharmacy to a higher and better plane a matter of importance to every member of the medical profession, for it means better and truer progress in this scientific selection and preparation of modern remedies in the treatment of disease. A pharmacist who is true to his calling, and alive to its scientific opportunities, is worthy of every consideration. He deserves the hearty commendation, support and coöperation of every practitioner of medicine and of the community, for he is playing a leading part, both in our present-day conflict with disease, and in the advancement of human health and well-being.—Editorial, *American Medicine*, February, 1925.

INVESTIGATION OF INTERNAL REVENUE AND PROHIBITION SERVICES.

The investigation of the internal revenue and prohibition services by the special committee headed by Senator Couzens of Michigan is to continue after the end of this Congress under a resolution recommended by the Senate finance committee. The extension of the life of the committee, however, would involve stoppage of its investigatory work June 1, 1925, after which the committee would prepare its report to the next Congress.

REPORT OF THE SECRETARY OF THE SECTION ON EDUCATION AND LEGISLATION.*

BY WILLIAM MANSFIELD.

The report of the Secretary of the Section on Education and Legislation is statistical as shown by the data received in answer to the questionnaires sent to the Conference Schools and the State Boards of Pharmacy.

One is greatly hampered in this work, however, by a failure of the Boards and the Schools to send their replies promptly or, as will be shown by the report, not to send them at all. Your Secretary found it necessary, in many instances, to send two letters and two sets of questionnaires, and finally telegrams, in order to secure the necessary data.

THE QUESTIONNAIRE DIRECTED TO CONFERENCE SCHOOLS OF PHARMACY.

A—Correct name and address of school.

B—Number of students admitted to first year class (freshmen).

C—Number of students admitted to second year class (sophomores).

D—Number of students admitted to third year class (juniors).

E—Number of students admitted to fourth year class (seniors).

F—Number of students admitted to the graduate school candidates for the Master's or Doctorate degree. M.S.....Ph.D.....

G—Number of other students admitted. H—Total number of students admitted.

I—Number of students rejected for poor scholarship or misconduct. 1st year..... 2nd year.....3rd year.....4th year.....

J—Number of high school graduates in first year class.....2nd year.....3rd year..... 4th year.....Total.....

K—Number admitted on high school certificates only.

L—Number admitted on state certificates only.

M—Number admitted on both high school and state certificates.

N—Number admitted on examination.

O—By whom examined.

P—Educational requirements for admission to course.

Q—Number graduated this year with the degree of Ph.G.

R—Number graduated this year with the degree of Ph.C.

S—Number graduated this year with the degree of B.S.

T—Number graduated this year with other degrees, specifying the degrees.

THE QUESTIONNAIRE ADDRESSED TO THE STATE BOARDS OF PHARMACY.

A—Name of state.

B—Number examined for pharmacist for year including June to June if possible.

C—Number examined for assistant pharmacist for year.

D—Total number examined for year. E—Of the above pharmacists passed.

F—Of the above assistant pharmacists passed.

G—Total number passed for the year.

H—Number from within state registered without examination. (State if upon diploma or how, omitting reciprocal registration.)

I—Number registered by reciprocity. J—Is N. A. B. P. plan followed?

K—New laws affecting pharmacy since last report (1923).

L—Board's rulings raising educational requirements in addition to, or in place of, above laws.

M—Unsuccessful attempts to raise educational requirements.

N—Unsuccessful because of lack of support of: 1. Schools. 2. Druggists. 3. Legislature. 4. Pharmacy boards.

O—Does your board favor a plan for the discontinuance of licensing assistant pharmacists?

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* For report of the minutes of the Section see pp. 1151–1158, December JOURNAL A. PH. A., 1924.

CHARTED RESPONSES FROM SCHOOLS OF PHARMACY.

A.		B.	C.	D.	E.
1	Ala. Polytech. Inst., Dept. of Pharmacy	31	23	8	5
2	U. of Calif., College of Pharmacy	..	..	..	..
3	U. of So. Calif., College of Pharmacy	125	90	5	8
4	U. of Col., College of Pharmacy	15	15	6	5
5	George Washington U., Nat. College of Pharmacy	15	8	7	1
6	U. of Ill., School of Pharmacy	229	155	0	0
7	U. of Notre Dame, School of Pharmacy	14	6	1	2
8	Purdue U., School of Pharmacy	64	33	6	5
9	Valparaiso U., School of Pharmacy	23	54	3	5
10	Des Moines U., College of Pharmacy	61	0	0	0
11	State U. of Iowa, College of Pharmacy	70	57	5	4
12	U. of Kansas, School of Pharmacy	42	36	10	3
13	Louisville College of Pharmacy	49	95	0	0
14	Loyola U. New Orleans, College of Pharmacy	..	..	..	..
15	Tulane U. of La., School of Pharmacy	..	..	..	..
16	U. of Maryland, Dept. of Pharmacy	101	74	3	..
17	Mass. College of Pharmacy	173	135	103	16
18	U. of Michigan, College of Pharmacy	29	24	8	16
19	Detroit Inst. of Tech., College of Pharmacy and Chemistry	..	..	..	..
20	U. of Minn., College of Pharmacy	62	55	23	2
21	U. of Miss., Dept. of Pharmacy	51	36	..	1
22	St. Louis College of Pharmacy	120	76	..	..
23	U. of Mont., School of Pharmacy	28	12	6	4
24	U. of Nebraska, College of Pharmacy	74	45	10	7
25	Creighton U., College of Pharmacy	80	48	4	0
26	New Jersey College of Pharmacy	140	128	..	..
27	Brooklyn College of Pharmacy	266	237	0	0
28	U. of Buffalo, College of Pharmacy	135	0	0	126
29	Columbia U., College of Pharmacy, City of N. Y.	454	294	9	2
30	Fordham U., College of Pharmacy	300	285	2	..
31	Union U., Albany College of Pharmacy	144	111	3	..
32	U. of No. Carolina, School of Pharmacy	56	43	2	0
33	N. Dak. Agricultural College, School of Pharmacy	26	17	4	1
34	Western Reserve University, Cleveland School of Pharmacy	66	55	13	3
35	Ohio State U., College of Pharmacy	136	6	0	0
36	U. of Okla., School of Pharmacy	..	..	..	..
37	No. Pac. College, School of Pharmacy	18	21	3	0
38	Ore. Agric. College, School of Pharmacy	57	36	43	13
39	U. of Pittsburgh, Pittsburgh College of Pharmacy	188	..	..	184
40	Phila. College of Pharmacy and Science	347	307	41	9
41	U. of the Philippines, School of Pharmacy	..	..	..	..
42	Med. Col. of State of So. Car., School of Pharmacy	..	..	20	24
43	S. Dak. State Col. of Agric. and Mech. Arts, Dept. of Pharmacy	38	21	3	5
44	Meharry Pharmaceutical College (Colored)	..	..	..	..
45	U. of Tenn., School of Pharmacy	25	18	..	..
46	Baylor University, School of Pharmacy	48	18	..	..
47	Med. College of Va., School of Pharmacy	63	29	0	0
48	State Col. of Washington, School of Pharmacy	80	48	16	10
49	U. of Washington, College of Pharmacy	45	45	34	12
50	U. of W. Va., Med. School, Dept. of Pharmacy	..	..	..	..
51	U. of Wisconsin, Course in Pharmacy	55	30	11	12
	Total	4143	2626	418	481

CHARTED RESPONSES FROM SCHOOLS OF PHARMACY.

A.	F.	G.	H.	I.	J.	K.	L.	M.	N.	O.	P.	Q.	R.	S.	T.	
1	0	1	68	7	31	31	..	..	..	..	4 yr.	3	1	5	..	
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
3	..	3	231	9	213	223	0	..	..	..	4 yr.	80	3	8	..	
4	1	2	44	5	44	42	0	0	0	..	4 yr.	0	4	5	0	
5	..	..	31	1	31	..	..	..	..	..	15U.	..	..	..	..	
6	0	1	384	64	384	384	0	384	0	..	4 yr.	126	0	0	0	
7	..	1	24	..	22	22	..	22	..	..	15U.	3	..	1	..	
8	2	0	110	6	108	108	0	0	0	..	4 yr.	29	0	5	..	
9	..	5	90	2	84	79	5	..	0	..	4 yr.	43	0	3	..	
10	..	9	70	6	77	66	..	..	..	..	4 yr.	17	1	1	..	
11	..	0	136	7	134	134	0	..	..	..	4 yr.	33	2	3	..	
12	..	..	91	6	87	87	0	0	0	0	4 yr.	12	6	3	..	
13	0	1	145	0	81	144	0	0	1	..	4 yr.	88	0	0	0	
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
16	1	9	188	28	178	145	33	..	..	..	4 yr.	63	1	..	1	M. S.
17	..	..	427	..	368	..	..	..	40	..	4 yr.	78	8	..	..	
18	5	2	79	7	79	79	..	..	..	..	4 yr.	..	12	5	..	
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
20	1	3	143	..	140	140	3	0	0	..	4 yr.	0	13	3	..	
21	..	..	88	10	88	88	..	..	..	..	4 yr.	29	..	1	..	
22	..	..	196	42	172	172	..	172	..	..	..	33	..	..	23	Ph. B.
23	0	0	50	6	22	..	..	..	..	..	15U.	10	3	2	..	
24	3	0	136	2	136	136	0	0	0	0	4 yr.	21	7	4	2	M. A., A.M.
25	0	0	132	13	80	80	..	..	..	..	30C.	34	4	0	0	
26	..	..	268	8	100	..	268	..	..	..	4 yr.	95	..	..	..	
27	0	0	503	3	159	0	503	503	..	..	3 yr.	203	0	0	0	
28	0	0	261	57	157	0	261	0	0	0	3 yr.	98	5	0	0	
29	..	71	827	10	759	0	0	448	6	..	4 yr.	239	8	0	0	
30	..	..	587	32	..	231	..	..	..	..	3 yr.	241	2	..	..	
31	..	2	260	..	163	229	31	229	31	..	3 yr.	111	3	..	..	
32	0	5	106	12	94	0	0	101	0	0	4 yr.	49	2	0	2	P.D. Doctor of
33	0	3	51	0	51	49	2	0	0	0	4 yr.	11	2	1	0	Pharmacy
34	..	1	138	11	134	0	0	134	6	..	4 yr.	32	3	3	0	
35	1	0	143	8	306	143	0	143	0	..	4 yr.	85	..	2	..	
36	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
37	..	5	47	0	25	..	4	47	..	..	15U.	..	1	1	..	
38	0	11	160	5	149	149	0	0	0	..	15U.	13	13	5	0	
39	9	3	384	27	372	..	384	..	..	..	4 yr.	128	3	4	21	Certificates
40	..	41	745	89	745	..	..	..	..	..	4 yr.	248	2	5	7	See data
41	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
42	0	0	44	3	41	41	0	0	0	..	15U.	23	0	0	..	
43	1	0	68	6	38	38	0	38	0	..	4 yr.	19	5	5	..	
44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
45	..	..	43	13	43	..	..	..	..	..	15U.	10	..	..	..	
46	..	..	66	7	56	56	..	..	..	..	15U.	15	..	..	..	
47	0	3	95	..	..	..	..	..	..	..	4 yr.	21	0	0	..	
48	1	2	157	..	..	..	..	..	..	..	4 yr.	30	4	3	..	
49	9	..	136	4	136	136	..	..	..	..	4 yr.	1	23	12	2	M. S.
50	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
51	10	1	119	9	106	..	..	..	2	..	4 yr.	12	..	10	6	M. S.
44	185	8071	525	6193	3234	1494	2221	86	0		2386	141	100	64	Total	

CHARTED RESPONSES FROM BOARDS OF PHARMACY.

No.	A.	B.	C.	D.	E.	F.	G.	H.	I.	J.
1	Alabama	139								
3	Arizona	51	18	69	27	14	41		6	Yes
4	Arkansas	315	104	315	104	0	104		5	Yes
6	Colorado	93	11	104	32	6	38	3	32	Yes
7	Connecticut	117	191	308	36	52	88		9	Yes
9	Delaware	17	16	33	8	11	19		3	Yes
10	District of Columbia	97	0	97	30		30		26	Yes
11	Florida						13	3[1]	75	Yes
12	Georgia	305	0	305	146	0	146	0	10	Yes
14	Idaho	25	0	25	11		11		7	Yes
16	Indiana	202	121	323	99	87	186		26	V.C.
17	Iowa	140		140	53		53		12	Yes
18	Kansas	282	11	293	73	5	78		15	Yes
19	Kentucky	212	29	241	53	63	116		16	Yes
20	Louisiana	202	20	222	126	16	142	0	32	Yes
22	Maryland	101	73	174	72	63	135		18	Yes
23	Massachusetts	460	172	632	71	56	127		23	Yes
24	Michigan	425	148	573	159	88	247		54	Yes
25	Minnesota	174	146	320	50	63	113		20	Yes
27	Missouri	208	315	523	162	162	324	37	57	Yes
29	Nebraska	126			107				16	Yes
31	New Hampshire	84	3	87	48	3	51		10	Yes
32	New Jersey	367	312	679	115	119	234		49	No
34	New York[2]	613	221	834	411	139	550	0	0	No[2]
35	North Carolina	35	1	36	20	1	25			Yes
36	North Dakota	13	5	18	13	3	21		2	Yes
37	Ohio	216	179	395	142	145	287		31	Yes
39	Oregon	97	7	104	81	5	86		24	Yes
40	Pennsylvania	595	829	1424	426	434	960		10	Yes
43	Rhode Island	131	131	131	64	64	64			
44	South Carolina	45		45	29		29	47	9	Yes
45	South Dakota	35	23	58	21	23	49	0	5	Yes
49	Vermont	37	37	37	12	10			3	Yes
50	Virginia	76	37	113	45	16	61		13	Yes
52	West Virginia	35	4	39	28	3	31	4	22	Yes
53	Wisconsin			275	69	90	159		13	Yes
54	Wyoming	60			40		40		5	Yes
	Total	6128	3161	8972	2983	1741	4658	94	644	

Note.—Numbers are left in regular order but no reports were received from the following states: 2, Alaska; 5, California; 8, Cuba; 13, Hawaii; 15, Illinois; 21, Maine; 26, Mississippi; 28, Montana; 30, Nevada; 33, New Mexico; 38, Oklahoma; 41, Philippines; 42, Porto Rico; 46, Tennessee; 47, Texas; 48, Utah; 51, Washington.—They are omitted from above list.

[1] Registered on medical license. [2] In addition NewYork examined 711 Junior Pharmacists and passed 469.

Data applying to preceding tabulations of the Schools of Pharmacy:

1. Four years high school or 15 Carnegie units required for entrance.
2. No state certificates granted in California.
3. Four years of high school work or 15 units required for entrance.
4. Fifteen units required for entrance to course.
5. One special student.
6. One irregular student.
7. High school graduation required for entrance.
8. Four years high school or 15 units required for graduation; 3 English units; 1 Mathematics; 1 Science.
9. Nine special students were admitted. High school graduation required for entrance.
10. Have two Federal Board students, not high school graduates; have only certificates, do not have the state certificate.
11. High school graduation required for entrance.
12. W. F. Bradbury, Louisville High School Faculty examiner when examinations are taken.
13. Registrar of University of Maryland evaluates all credentials.
14. High school graduation or its equivalent 75 counts required for graduation.
15. At the end of the Summer Session 1923, 4 Ph.C. degrees and 2 B.S. degrees were granted which were not included in last year's report.
16. Three "War Specials" were admitted.
17. High school graduation required for entrance to course.
18. Graduation from a high school accredited with the University of the state, or an equivalent education determined by a University, State Superintendent of Public Schools or other similar authority—we do not have an examination for the equivalent. Sixteen freshmen and eight seniors were special students and not candidates for a degree and admitted without certificates.
19. State certificates are not used in this state.
20. Thirty credits required for entrance.
21. All new students admitted for session 1923–24 are high school graduates or have the equivalent. Those who were left over from the previous year did not have to be graduates, as the entrance requirements for 1922–23 were only two years of high school work.
22. All students must have a pharmacy student qualifying certificate issued by the University of the State of New York.
23. Three years of high school work required for entrance.
24. There were three special students and sixty-eight evening classes.
25. All high school graduates are required to have state certificates.
26. There were thirty-one examined by the State Education Department, admitted on examination.
27. The three students (besides the one auditor) who were not high school graduates were entered under the old law on their age and experience, when high school graduation was not required.
28. High school graduation required for entrance.
29. There were five special students admitted.
30. Of these eleven special students, none of whom are candidates for any degree: two are college graduates, doing special work in pharmacy; four are Federal Board Rehabilitation men; five are nurses, pursuing a training course in a local hospital, and are registered in the School of Pharmacy for special instruction.
31. Twenty-one certificates were granted.
32. There were 7 Bachelor in Pharmacy degrees; 5 Technical Chemistry degrees and 30 qualified for certificates of proficiency in special branches granted.
33. Note that during the sessions 1922–23 and 1923–24 that we required 15 units for entrance. However, three men came back, who were left-overs from the year before. At that time only three years of high school was required. We give only one course and this is the two-year course leading to the degree of Graduate in Pharmacy.
34. Four years of high school required for entrance.

35. Fifteen Carnegie units required for entrance.

36. Fifteen units required for entrance.

37. Of the sixty-three of the first year class, a large number that did not have four years of high school work could not be matriculated; of the sixty-three who matriculated in the freshman class, only about one-third are now qualified to enter the senior class; about twelve are attending summer school to make up the deficiencies. Twenty-one out of a class of twenty-nine graduated.

38. High school graduation is required for entrance.

39. Two M.S. degrees were granted.

40. One fourth year student rejected for dishonesty in student work; eight rejected for poor scholarship. Two students, not graduates of accredited schools, admitted upon passing the regular entrance examinations of the University. Regular entrance requirements of the University—graduation from an accredited school or examination at the University. Entrance to the Course in Pharmacy differs in no respect from that to other courses of the University. Three more (making twelve in all) will receive the degree Ph.G. at the close of the summer session. Two more (making ten in all) will receive the degree B.S. Pharmacy course, at the close of the summer session. Six will receive the degree M.S. at the close of the summer session.

Data applying to preceding tabulations of the Boards of Pharmacy.

1. K, in 1927 all applicants must be graduates of Class A Colleges of Pharmacy, and have four years of high school training—Board ruling; M, none; O, law goes into effect January 1, 1927.

4. K, the board may prescribe the education and experience qualifications effective—1925; M, impossible because of prerequisite law; N, unsuccessful because of violent opposition of legislature; O, impossible for us to decide until the minimum three-year course is adopted.

6. K, none; L, none—requirements are fixed by law; M, tried at legislative session of 1923 to secure college of pharmacy graduation prerequisite, carrying high school graduation as preliminary to matriculation, but failed; N, to some extent because of lack of support from all the interests named, but chiefly because of unusual conditions in the legislature, by reason of which our measures were never reported out of committee, so never had a chance; O, no, we do not favor the abolishment of the assistant grade, but feel rather that there should be a permanent class of that character.

7. K, none—Legislature meets every two years, January 1, 1925; L, 1925 College requirement; O, no.

9. K, none—an effort will be made to pass a prerequisite law at next meeting of the Legislature; L, One year high school—July 1, 1924; M, none; O, no.

10. K, none; M, bill presented to Congress provided for graduation as a prerequisite; N, unsuccessful because of lack of support of Congress.

11. K, none; L, two years' High School, four years' practical experience.

12. K, require two years of High School; O, yes.

14. K, none; L, no change; M, bill requiring graduation in conformity with N. A. B. P.—recommendations lost in last session of Legislature; N, lost on account of opposition of Lieutenant-Governor; O, yes.

16. K, none; L, none; M, none; O, yes.

17. K, none; L, none; M, none; N, none.

18. K, none; L, none; M, none; N, nothing requested; O, no.

19. K, none; L, College of Pharmacy graduation now required; O, no.

20. K, overlapping terms of Board Members effective at once, prerequisite effective January 1, 1927; L, none; O, no.

21. Maine; K, none; L, none; M, none; O, yes.

22. K, on account of 1924 Legislature places the enforcement of pharmacy laws with the State Board of Health under the direction of a Deputy Drug Commissioner.

23. K, citizenship required of applicants for registration as pharmacist or assistant—minor changes in narcotic, liquor, and hypodermic instrument laws; L, none; M, tried to have law requiring College of Pharmacy graduation; N, unsuccessful because of lack of support of druggists and of the Legislature; O, no plan would work which did not repeal the existing law—doubtful if same could be repealed.

24. K, passed Act 85 P. A. 1923—venders' licenses—law creating a director—all laws

regulating the manufacture and sale of drugs are enforced by Board of Pharmacy; L, Michigan Board of Pharmacy has no authority to make rules raising educational requirements; M, no; O, absolutely not.

25. K, none; L, none; M, none; O, has not been discussed.

27. K, four years of high school; L, four years of high school; M, requiring college graduation defeated by the Legislature; N, unsuccessful because of non-support by druggists; O, no.

28. Montana; K, none; L, completion of eighth grade—1 year of college—3 years of practical experience.

29. K, no new laws.

31. K, none; L, none; M, none; O, of little practical value in the opinion of the writer.

32. L, Board has adopted a resolution requiring that, in order to receive recognition as an approved college or school of pharmacy, every such institution must, on and after September 1, 1925, provide that its minimum course of instruction shall be three years covering 2250 hours of instruction and a degree for the course shall be that of a "Graduate in Pharmacy"—the course shall consist of not less than 40 per cent instructions and lectures and recitations and not less than 40 per cent of laboratory work; O, yes, unless the standards for registration of Assistant Pharmacists are raised so as to be in harmony with the advanced standards required for registration of Pharmacists.

34. K, in 1923 law was amended requiring that the owners of registered pharmacies and drug stores shall be licensed pharmacists or druggists—in 1924 law was amended, not permitting the use of the words "pharmacy or drug store" except by a registered pharmacy or drug store—an applicant who has not had the requirements for admission to the examination for pharmacist or junior pharmacist, and is a graduate of a registered school of pharmacy, may take the examination in the theoretical subjects only—after January 1, 1926 no junior pharmacist license may be issued—candidates must be a resident of the United States, or have filed an application to become such; L, after January 1, 1928 three years in a registered school of pharmacy required—after January 1, 1925 must have four years of high school or equivalent—after January 1, 1928 necessary to have two years practical experience in a registered pharmacy or drug store before entering a pharmacy school; M, none; O, yes.

35. K, none; L, we have the graduation requirements in the state; O, no.

36. K, none; L, none; M, none; O, no.

37. K, amendment to law requiring fees for registration increased; L, none; M, none; O, yes.

39. O, have not considered it.

40. K, reported in 1923—Legislature convened in 1922—passed Administration Code, placing Board of Pharmacy under "Department of Public Instruction—term changed from five to six years; fees from $10 to $15; L, Board has ruled for three-year course leading to Ph.G. degree beginning course 1925; O, no.

43. K, no change; L, no change; M, the R. I. College of Pharmacy requires two years of high school for entrance; O, no.

44. K, none; L, none; M, none; N, none.

45. L, four years' High School and two years' pharmacy.

49. K, none except the biennial fee raised from two to four dollars; O, no.

50. K, the Penalty Bill and the Smith Pharmacy Bill; L, by Board ruling two years of high school work, instead of one, required of applicants for Assistant examination; M, none; N, received fine support from all of these groups on our legislative program; O, have about come to the conclusion that this grade ought to be abolished. Had a bill in our last Legislature to accomplish this but had to kill it because it carried a provision to automatically register as pharmacists all present assistants.

52. K, none; L, requirement of graduation from a college of pharmacy giving two-year course; M, none; O, yes.

53. K, none; L, approved model pharmacy law with modification; M, lost legislation from 2 years' to 4 years' high school requirements; N, unsuccessful because of lack of support of druggists and of Legislature; O, no.

54. K, none; L, high school graduation, four years' experience; M, unsuccessful because of lack of support of druggists and Legislature; O, yes.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council."—Part of Chapter VI, Article VI of the By-Laws.

Article IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches should be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter.

WORK OF THE A. PH. A. BRANCHES.

The comment following on above subject is part of an editorial from the *Pharmaceutical Era* of March 28, and relates to the programs of several recent meetings; other branches held equally interesting sessions.—

"Thus, the pharmacists of Chicago were privileged to hear a most informative address on some of the newer things in medicine, a subject of prime importance to the scientific dispenser. In Philadelphia, the members of the branch were given an opportunity to witness a demonstration staged to portray selling principles, typical sales situations being reproduced under a close approximation of everyday conditions. Members of the Baltimore branch were favored with an address by Dr. Lloyd on some recent views of atomic structure, while Cincinnati pharmacists discussed the prescribing of heroin in the light of legislative prohibition and consequent high prices.

"The facts we have noted furnish evidence of the possibilities of the A. PH. A. branches for disseminating scientific information to say nothing of the unusual educational opportunities they afford to those who will attend them. The same reasons that are urged upon physicians to join medical societies can be advanced why pharmacists should join associations which devote their efforts mainly to the scientific side of pharmacy. We would not belittle the effort that has been made to emphasize the value of merchandizing or of business methods to the pharmacist, for one cannot successfully practice pharmacy in this intensely commercial and practical age unless he has mastered the principles of business. But on the other hand, if the pharmacist is to retain his principal claim to his profession, he must use every opportunity to keep himself posted in all the advances that are being made along the professional side of his business. It seems to us that the A. PH. A. branches are furnishing such opportunities."

BALTIMORE.

The February meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Hotel Emerson February 25th, 1925, Dr. Robert L. Swain presiding.

Dr. H. H. Lloyd, Professor of Chemistry of Goucher College, was the speaker of the evening, on the subject "Some Recent Views of Atomic Structure."

Dr. Lloyd mentioned that the atomic theory of Dalton and the hypothesis of Prout served as an introduction to the consideration of the two chief ways in which modern research has enabled us to explain the curious jumble of integral and fractional atomic weights. He stated, first, that the study of radioactive transformations has proved the existence of isotopes, elements chemically identical but having different atomic weights; secondly, that positive ray analysis, and especially the use of the mass spectrograph, has enabled us to determine the relative weights of the various kinds of atoms which constitute isotopes. Dr. Lloyd also stated it has been shown that the weights of atoms are whole numbers, and that fractional atomic weights are due to a mixture of two or more kinds of the same element with different weights. The structure of the atom was considered, and the probability of reconciling the views of Bohr and of Lewis and Langmuir was discussed. Finally, the subject of atomic disintegration was touched upon, and the recent work of Rutherford and of Harkins mentioned.

The members of the Baltimore Branch were especially fortunate in having Dr. Lloyd as the speaker, and interest in the subject presented

was evidenced by the large number who attended the meeting.

Mr. David Hecker, who is a senior in the School of Pharmacy, University of Maryland, and his "Maryland Orchestra" rendered some very enjoyable musical numbers.

Dean Charles H. LaWall, of the Philadelphia College of Pharmacy and Science, was the guest of the Branch at the March Meeting on the 24th, at the Emerson Hotel.

B. OLIVE COLE, *Secretary-Treasurer.*

CHICAGO.

The 149th meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Friday evening, March 6, at the University of Illinois, School of Pharmacy Bldg. President L. E. Warren opened the meeting and requested Dean W. B. Day to preside. After a preliminary announcement, Dean Day presented President Warren, who spoke on "Some of the Newer Things in Medicine."

Mr. Warren's address was most interesting and instructive and embraced a short discussion of the most recent investigations regarding the following medicinal agents:

1. Carbon tetrachloride combined with Ascaridol for the treatment of Hookworm disease, is found to be more effective than when either is used separately. This seems to be due to the fact that carbon tetrachloride is especially efficacious against the female worm and ascaridol against the male worm. The remedy is being extensively used on the great coffee plantations in Brazil and in many other tropical and semi-tropical locations with marked success.

2. Cod liver oil vitamine content and its standardization to anti-rachitic values, by the use of rats, is a pronounced success. The rats are first vitamine-starved and then vitamine-fed by the use of minute quantities of cod liver oil in the diet for a relatively short time. The animals are killed, certain portions of the bones soaked in silver nitrate solution, exposed to light, sectioned and examined under the microscope. The effect of the vitamine on the deposition of calcium in the bone tissue can be closely standardized. A good grade of cod liver oil is 100 to 400 times as valuable in anti-rachitic properties as is butterfat. Another method of standardization is to feed rats suffering from artificially produced lack of vitamine A with minute amounts of the cod liver oil to be tested and observing the growth-promoting effects as compared with controls not fed with the oil. The Newfoundland cod liver oil is apparently richer in vitamines than Norwegian because the Newfoundland cod feed during the summer in the shallow waters of the "Newfoundland Banks" on Caplin and Squid both of which are rich in vitamines and which can be had in large quantities in the shallow bays without much muscular exertion by the Cod.

3. Iodized ethyl esters from Chaulmoogra Oil in the treatment of Leprosy are especially successful in young persons and where the disease is of less than a year's duration. The ethyl esters of linseed oil have proved useful in the same disease but are not so valuable as those of Chaulmoogra Oil.

4. Basic bismuth tartrate in the treatment of Syphilis, especially after an arsenic-fast condition has developed, is bringing good results. It is used in an insoluble form by intra-muscular injections and never orally or by intravenous injection.

5. Insulin. The magnitude of the literature since its discovery probably exceeds that of any other drug known for so short a time. A small quantity of sugar has been used to counteract over-doses of Insulin. It is now known that Mannite and Maltose probably are better for this purpose than other sugars. Lactose is of no value.

6. Immunization for Scarlet Fever, as developed by the Doctors Dick, is a definite advance in medicine. Filtrates from certain strains of hemolytic streptococcus induced the disease in human subjects and from the blood a toxin was obtained which also produced the disease. The injection of this toxin into horses developed an antitoxin and this antitoxic serum is definitely curative as well as prophylactic.

7. Synthetic cocaine, dextro-psicocaine (psicaine), has been produced by German investigators after nearly twenty years of effort and by a most complicated synthetic process. Whether the synthetic product is habit-forming is not yet determined. Because of the large amount of cocaine produced in this country in the decocainizing of coca leaves, it is doubtful whether the synthetic product will find a market here.

8. Chloral Hydrate in suppositories for seasickness, has been found very valuable.

9. "Intarvin," a calorie producer in diabetes, is a glyceryl ester of margaric acid, a 17 carbon-atom chain. Apparently because it is an odd-number carbon compound, it burns completely in the body without forming toxic

by-products such as acetone, diacetic acid, etc.

10. Phenol-tetrachlor-phthalein as a diagnostic of liver functioning is used intravenously, and if the liver is functioning normally, will be removed from the blood in a few minutes, but if the liver function is not up to normal it may remain in the blood for hours, and can be detected there by appropriate tests.

11. Tetrabrom-phenolphthalein as a diagnostic for gall stones seems to render the gall stones visible as shadows in a roentgenograph.

12. Ethylene for anaesthesia is less irritating than ether but is so very inflammable and explosive that its use is probably limited.

13. Mercurochrome as a germicide in septicemia is used intravenously and is sometimes very successful and again apparently valueless.

14. Gentian Violet is also being used as a germicide in septicemia.

In the discussion, Prof. Clark called attention to the fact that ultra-violet rays from quartz lamps seem to increase the anti-rachitic value of oils, cows' milk, and even to be antirachitic to children.

Mr. Webster inquired as to whether the vitamines had been isolated as a substance or did these simply represent a rearrangement of the atoms in the oil molecule.

Mr. Linke called attention to the curative value of sunlight and chlorophyll.

Mr. Becker stated that both Mercurochrome and Acriflavine can be sterilized by heat. He also stated that Mercurochrome stains badly but that these stains can be removed by washing in spirit of nitrous ether.

E. N. GATHERCOAL, *Secretary.*

CINCINNATI.

The February meeting of the Cincinnati Branch A. PH. A. was held at headquarters of Ohio Valley Druggists' Association on the 7th; President Hermann E. Igler called the meeting to order; both organizations were well represented. The subject for discussion related to the manufacture of U. S. P. and N. F. preparations by retail pharmacists. Papers were presented by Messrs. Wm. L. B. Brittain and H. B. Waltermann; samples of various U. S. P. and N. F. preparations were exhibited.

The March meeting was mainly devoted to a discussion of subjects relating to the prescription department—how it should be conducted and developed. Papers by Messrs. Julius Naefach and H. J. Dusterberg served as leaders for the discussion. State Inspector A. G. Snow was present.

The officers of the Cincinnati Branch are:—*President,* Hermann E. Igler; *Vice-President,* H. B. Waltermann; *Secretary,* Bertha Ott; *Treasurer,* Wm. L. B. Brittain, *Delegate to the House of Delegates, A. Ph. A.,* Caswell A. Mayo.

BERTHA OTT, *Secretary.*

DETROIT.

The February meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held February 20th at the Wayne County Medical Building. The meeting was called to order by President Chostner. In absence of Secretary Bialk the President appointed Mr. J. H. Webster to act as Secretary. Minutes of the previous meeting were read and approved.

A letter from Dean Kraus of the College of Pharmacy of the University of Michigan inviting the Detroit Branch to hold its April meeting at Ann Arbor was read. Motion was made and carried that the invitation be accepted with thanks.

Considerable discussion was had concerning the holding of a Mock Trial as the attraction for the March meeting. President Chostner suggested that the Committee consult with certain Detroit members of the bar who might assist in getting up a program and arrange for holding of the proposed Mock Trial.

The address of the evening was given by Dr. Lichtwardt of Meshed, Persia, who delivered an interesting talk on Medicine and Pharmacy in Persia. After learning of the condition concerning Pharmacy in Persia, it was felt that Pharmacy in the United States was not entirely lost.

JOHN H. WEBSTER, *Acting Secretary*

MARCH MEETING.

The March meeting of the Branch was held at the Wayne County Medical Bldg.

In the absence of President Chostner, Vice-President Grommett called the meeting to order. The usual good dinner preceded the meeting.

The minutes of the previous meeting were read by the Secretary and approved. A letter from Dean Kraus of the College of Pharmacy of the University of Michigan was read asking the Detroit Branch to set April 24 as the date for the meeting in Ann Arbor. He announced that Prof. Howard B. Lewis, Professor of Physiological Chemistry, would speak on Insulin. The date was unanimously accepted

and the arrangements left to the Program Committee.

The speakers of the evening needed no introduction. Every possible means for breaking the Hoodoo (Friday the 13th) was resorted to. A red head led in the program and Mr. Webster completed the combination by presenting Mr. Ingram with a white horse, and the program was off with a bang.

Mr. Ingram read several very interesting papers on Business and outlined many schemes for increasing retail drug business. He also gave several demonstrations of Catchy Toilet Goods Displays for both window and counter.

The speaker laid stress on three points for Toilet Goods Display, namely, simplicity, a few articles neatly pyramided, and, most important, the price card.

Walter M. Chase then followed with a talk on Candy Sales which was very interesting. Dan Houser followed with a stirring talk on Salesmanship and Coöperative Sales. He gave several examples of salesmanship and mass sales which help materially in building up a volume.

A general discussion followed in which Mr. Weaver led in outlining his ideas of merchandizing. A general exchange of ideas followed.

BERNARD A. BIALK, *Secretary.*

NEW YORK.

The February, 1925, meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was called to order in the lecture hall of the New York College of Pharmacy Building, Monday the 9th. Vice-President Eddy opened the meeting explaining that because of important legislative work Professor Hostmann had to remain in Trenton and could therefore not preside. Thirty-eight members and friends were present.

The minutes of the preceding meeting were read and approved.

Treasurer's Report—Treasurer Gerstner brought in his report showing a balance of $431.83.

Education and Legislation—Mr. Lehman presented a report outlining bills now before State and National legislative bodies of direct interest to pharmacists. Dr. Diner amplified this report.

Membership Committee—The following applications were received for membership: PARENT ORGANIZATION—Joseph Jay Blitzer, 1001 Willow Ave., Hoboken, N. J.; Joseph B. Cairoti, 1036 Washington St., Hoboken, N. J.; Maurice DeBari, 200 Garden St., Hoboken, N. J.; John G. Graef, 478 Westside Ave., Jersey City, N. J.; Samuel Kidorf, 740 Washington St., Hoboken, N. J.; Jacob Rutes, 444 Howard Ave., Brooklyn, N. Y.; Reuben Schwalberg, 1324 Carrell St., Brooklyn, N. Y.; Dr. Carl P. Sherwin, 41 Anderson St., Scarsdale, N. Y.; Edward Charles White, 537 Bloomfield St., Hoboken, N. Y. N. Y. BRANCH—Samuel Klempner, 276 Albany Ave., Brooklyn, N. Y.

Audit Committee—Dr. Diner reported that the books of the Treasurer were in splendid shape and all accounts found correct.

Unfinished Business—Dr. Diner brought up the matter of our membership in the New York Pharmaceutical Conference and stated that he would assure the Branch no financial burden would be placed upon them. It was moved, seconded and carried that we take the motion regarding the continuation of membership in the Conference off the table. It was moved, seconded and carried that we continue our membership in the Conference and authorize the appointment of two delegates with payment of $10.00 for each, but that we assume no further financial responsibility.

Communications—A letter from Dr. Horstman, Secretary of the Academy of Pharmacy, was read and Dr. Diner discussed the work of the Academy.

Scientific Section—Dr. Diekman presented his report consisting of abstracts of various articles in the current journals.

Mr. S. Kopald, speaker of the evening, was now introduced and presented a very interesting paper on "Fighting Back." Mr. Kopald took up principally the methods used by the Bronx County Pharmaceutical Association in combating price-cutting and other evils confronting the druggist. A short discussion followed after which a rising vote of thanks was extended the speaker.

HUGO H. SCHAEFER, *Secretary.*

MARCH MEETING.

The March, 1925, meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Monday, March 9th, with President Hostmann in the chair. Thirty-eight members and friends were present.

Minutes of the preceding meeting were read and approved.

Education and Legislation—Chairman Lehman reported on the following: The failure of the Cramton Bill to pass; The attack upon the

pharmacy ownership bill by amendments annulling the advantages of the original bill; Weinfeld-Kennedy narcotic control act: Prohibition enforcement laws; Medical practice act; Pharmacy ownership bills in other states.

Membership Committee—The following applications were received for membership: PARENT ORGANIZATION—Jacob Brody, 33 Sumner Ave., Brooklyn, N. Y. LOCAL BRANCH—Max Gluckman, 390 Bushwick Ave., Brooklyn, N. Y.

Audit Committee—Dr. Diner reported all bills paid.

It was moved, seconded and carried that a local committee on transportation be appointed to arrange for the trip to Des Moines, Ia.

New Business—Dr. Hostmann announced that he had appointed Dr. Diner and Mr. Eddy to represent the Branch as delegates of the New York Pharmaceutical Conference.

It was moved, seconded and carried that the Chairman be empowered to appoint a committee to make suitable arrangements for the presentation of the 1925 Remington Honor Medal.

Dr. Diekman, Chairman of the committee on Progress of Pharmacy, read abstracts of a number of scientific articles in current journals.

Chairman Hostmann now requested Dr. H. H. Rusby to introduce the speaker of the evening. Dr. Rusby in doing so described the efforts and work of Professor Maldonado of the Institute of Pharmacy of the University of Lima, Peru. Professor Maldonado's paper was read in English by Mr. Amand Lemaitre.

Considerable discussion then followed and Professor Maldonado answered various questions put to him. A rising vote of thanks was extended to the speaker.

HUGO H. SCHAEFER, *Secretary.*

OFFICERS NORTHWESTERN BRANCH, A. PH. A.

The officers of the ensuing year of the Northwestern Branch, A. PH. A., are:— *President,* A. J. Kline, Minneapolis; *Vice-President,* Miss Frances Greenwalt, St. Paul; *Secretary-Treasurer,* C. V. L. Netz, Minneapolis.

PHILADELPHIA.

The March meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on Tuesday evening, March 10th. The regular dinner, at which twenty-three members were present, was held at the Hotel Longacre preceding the meeting proper.

The meeting was called to order by President Harrisson at 8:30 o'clock at the P. A. R. D. Building, 2017 Spring Garden Street. The minutes of the last meeting were read and approved and the following were elected to membership: Rubin Fried, Edwin Bird, L. H. Green, and K. F. Ehmann.

Mr. Hunsberger reported that plans had been definitely made to hold our next meeting jointly with the Philadelphia County Medical Association probably at the College of Physicians, on Wednesday, April 8th. The program as tentatively arranged will consist of a paper by Dr. Harvey Wiley with a discussion led by Professor LaWall, a paper by Professor Cook and one also by Mr. Hunsberger. An invitation was extended to all who might be interested to attend the meeting. The Branch ratified the plan as presented and decided to hold its April business meeting at the regular dinner preceding the joint program.

Professor Cook reported that the plans for having the Local Branch take part in the annual convention of the American Medical Association at Atlantic City in June were materializing. It is expected that an exhibit of the U. S. P. preparations will be prepared by the Branch for this meeting and several papers probably will be presented.

Mr. Eberle reported for the committee on nominations as follows:

For *President*—Mortimer M. Smith.

For *1st Vice-President*—Raymond Hendrickson.

For *2nd Vice-President*—Arno Viehoever.

For *Secretary and Treasurer*—Adley B. Nichols.

Delegate to the House of Delegates—Ambrose Hunsberger.

Upon motion, Professor Griffith cast a unanimous ballot for the nominees as read and they were declared elected. The new officers were called upon for a few words and retiring President Harrisson gave a few parting remarks thanking the members of the Branch for their coöperation in making the past year a success.

President Harrisson then introduced Professor Paul C. Olsen of the Wharton School of Finance and Commerce, of the University of Pennsylvania. Professor Olsen gave a brief synopsis of the feature of the evening's program, salesmanship, outlining the story of selling principles and explaining the various points that were to be looked for during the demonstrations which were to follow.

The participants in the sales demonstrations were all actively engaged in Pharmacy. Mr. Hunsberger was proprietor of the store with Mr. Hendrickson acting as chief clerk and J. C. Pilchard assisting. Miss Kathleen Cawley, Miss Sadie Brisgol and Malcom Cox were the customers, while Edward Hahn took the part of the representative with biologicals.

The room in which the demonstrations were conducted was equipped to represent a modern drug store. Up-to-date show cases and actual merchandise were used. The audience was seated facing the "store" cases and counters so that they could hear and observe everything that took place.

"Customers" entered from an anteroom, made purchases, had them wrapped, paid real money for them and departed. During the progress of the various retail sales a representative of a pharmaceutical house appeared and undertook to sell the "store" proprietor a new line of biological products. During his talk the usual interruptions occasioned by visits of retail customers occurred. Typical sales situations which occur frequently in retail drug stores were illustrated by the various "customers." One appeared complaining of an ailment for which only a physician could prescribe. In another case the customer complained of the high cost of a prescription. The reasons were tactfully and satisfactorily explained to him. Another situation illustrated the possibility of converting an impatient request for stamps to a profitable sale of box stationery and ink.

The aim of these sales demonstrations was to simulate as far as possible actual selling conditions. None of the demonstrations were rehearsed beforehand. "Customers" were instructed to ask for one specific article. The sale of additional goods depended upon the skill of the salespeople. As a further insurance of naturalness the customers were instructed to pay for the purchases they made with whatever money they had in their pocketbooks. This overcame a tendency toward overbuying which might have occurred had only "stage" money been used.

The demonstration method was chosen to portray selling principles because it was believed that the actual sales themselves, occurring under a close approximation of every-day conditions, would illustrate these principles far more vividly and effectively than hundreds of abstract explanations and discussions. The demonstrations were another typification of the ancient Chinese proverb: "One picture is worth ten thousand words."

Following the demonstrations a general discussion of the sales principles exemplified occurred. The discussion was led by Professor Olsen. Several of the sales were illustrations of the possibility of selling related goods; a tooth brush with tooth paste; hair tonic with shampoo cream; pens with stationery, etc. The dangers of carrying such a policy to extremes were pointed out. People dislike to trade at a store if they feel that every time they enter to make a small purchase they will be urged to buy many expensive related articles. The reason for such a feeling on the part of customers is not so much the fault of suggestive salesmanship as it is the way the suggestions are made. The customer should not be made to feel that he is being sold something; he should feel that he is buying something. As far as the salesman is concerned this means that he should talk in terms of what uses his merchandise has rather than the actual merchandise itself; not the fact that a certain cold cream has a cacao butter base, but the fact that because it has a cacao butter base it has certain desirable qualities.

The number of additional articles which can be sold by suggestive salesmanship to one customer at one time of course varies with the circumstances. A woman obviously looking around can be sold more than a man with two minutes in which to buy a tooth brush and catch the last train for home. Usually the limit is not more than two or three additional articles. Of course, this average is not maintained with every customer or even every other customer. The point is that even if only one customer in ten is sold additional articles by suggestive salesmanship there is a ten per cent increase which would not otherwise have been obtained.

Success in suggestive salesmanship implies a knowledge of the goods and the purposes these goods serve. A salesman who suggests a sponge to a person who has just bought a box of bath soap is in a far better position to make the sale if he can explain interestingly the delightful qualities of a Mediterranean sponge instead of being able to quote only sizes and prices.

And for the customer who won't listen long to explanations a demonstration based on a knowledge of what the goods will do often serves to make the sale. In the case of the salesman who has a customer wondering whether to buy a $3 or a $7 fountain pen, con-

sider which of the following methods is the more likely to make the sale. In one case he talks vaguely of the $7 pen being of better quality than the $3 pen. In the other case he points out to the customer the fact that the two parts of the point of the $7 pen are electrically welded together, which forever prevents them from spreading and thus greatly increases the life of the pen. And to prove his statement the salesman drops the pen point downward on the linoleum-covered floor of the store. The point buries itself in the linoleum. The pen is picked up and handed to the customer with the invitation to try its writing quality to show that it is just as good as ever. Such a demonstration would of course ruin a $3 pen.

Sometimes both the customers and the sales people are in woeful ignorance of the qualities and purposes of some of the merchandise in drug stores. Explanatory signs and displays of the merchandise itself help to make sales which otherwise would not occur. The drug-store proprietor should recognize a certain mental laziness on the part of his customers. He should relieve the customer as far as possible of the burden of determining what he wants or may want. In his selling talks, in his window and store displays and the explanatory signs which always should accompany them he should be ever alert to suggest new uses and enjoyments from the merchandise he has for sale.

This involves of course a personal knowledge of individual customers, their preferences and tastes, likes and dislikes. Often the most casual personal conversation may lead to a sale which is mutually profitable. An infirm aunt may everlastingly bless a nephew for a gift of an electric warming pad. Perhaps the suggestion (and resulting profit) orginated with a drug-store salesman.

In many lines, particularly those most closely associated with pharmacy, the drug-store salesman is apt to assume a knowledge of pharmaceutical matters on the part of his customers far beyond the actual fact. For example, a pharmacist may talk knowingly about an antiseptic mouth wash as being a U. S. P. or N. F. preparation and this characterization may not make the slightest impression on the customer. Perhaps not one person in a hundred outside the pharmaceutical field knows what these initials really mean. A pharmacist could explain to the customer the value to him of the U. S. P. and N. F. designation in such a way that the customer would be thoroughly convinced of the merit of the product and the store which sold it.

By way of summary the following may be said to be the sales principles which were exemplified by the sales demonstrations.

1. Sell related goods whenever possible but not at the risk of offending the customer.
2. Know the uses of the goods—what they are and what they will do.
3. Use displays and signs to help sell more goods, especially to satisfy unexpressed wants.
4. Know customers, their preferences and tastes.
5. Be sure the customer understands and appreciates what you tell him.

At the close of the demonstrations and discussion a unanimous vote of thanks was given to all the participants and President Harrisson stated that he also would send a letter personally thanking each of those concerned.

A vote of thanks was tendered also to the officers of the Branch for their work of the past year. The meeting then was turned over to the new President, Mortimer M. Smith, who pledged himself to do his utmost for the Branch during the coming year.

Mr. Swain, President of the P. A. R. D., told the Branch of plans being completed for the addition of a new hall to their building and offered the use of the Building to the Branch for its meetings and any functions which it desired to carry on there. He also stated that the P. A. R. D. would coöperate in the plans for adding to the contributions already made toward the A. PH. A. Headquarters' Fund.

There were over fifty members and friends in attendance. The Secretary is indebted to Professor Paul C. Olsen for the report on the sales demonstration proper.

ADLEY B. NICHOLS, *Secretary.*

GERMAN DRUG FAIR.

Much interest is being displayed by druggists throughout Germany in the German Drug Fair, which is to be held at Stuttgart, from August 1–9, 1925, under the auspices of the Bezirksverein Württemberg of the Deutscher Droguisten-Verband E. V. (Württemberg branch of the German Druggists' Association), the former having its headquarters at Stuttgart, and the latter at Berlin.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1924–1925.

Office of the Secretary, 192 Roseville Ave., Newark, N. J.

LETTER NO. 5.

March 16, 1925.

To the Members of the Council:

47. Budget for 1925. Motion No. 19 (see item 37, Letter No. 4, page 153) has been carried and the budget is approved.

48. Employment of Auditors. Motion No. 20 (see item 38, Letter No. 4, page 152) has been carried and the W. A. Johnson Company has been selected to audit the books of the treasurer.

49. Award of Journal printing contract. Motion No. 21 (see item 39, Letter No. 4, page 152) has been carried and the contract for printing the JOURNAL for 1925 has been awarded to the Eschenbach Printing Company.

50. Award of National Formulary printing contract. Motion No. 22 (see item 40, Letter No. 4, page 152) has been carried and the contract for printing the National Formulary V has been awarded to the Eschenbach Printing Company.

51. Approval of Committee Appointments. The Committees on Ebert Prize and on Place of Meeting (see item 41, Letter No. 4, page 152) have the approval of the Council.

52. Solicitors for Headquarters Building Fund. Motion No. 23 (see item 43, Letter No. 4, page 152) has been carried and the employment of solicitors in New York City for test purposes is authorized.

53. Election of New Members. Motion No. 24 (see item 44, Letter No. 4, page 154) has been carried and applicant for life membership numbered 5 is declared elected. Motion No. 25 (see item 45, Letter No. 4, page 153) has been carried and applicants numbered 72 to 123 inclusive are declared elected. Motion No. 26 (see item 46, Letter No. 4, page 154) has been carried and applicants numbered H-8 and H-180 to H-241 are declared elected.

54. Meeting of the Executive Committee of the Council. (See pp. 261–268, March JOURNAL A. PH. A.)

(*Motion No. 27.*) *It is moved by LaWall that the Minutes of the meeting, as presented herewith, be approved by the Council and that the decisions of the Executive Committee become the decisions of the Council.*

55. Change in Date of Des Moines Meeting. The following communication has been received from Secretary Day:

"DEAR DR. FISCHELIS:

"A complication has arisen with regard to the date selected for our annual meeting at Des Moines. The Iowa State Fair will meet in Des Moines August 26th to September 4th and as the Fair brings a great many people to Des Moines—in fact, I am informed that it is next to Minnesota, the largest state fair in the United States—our convention would be interfered with to the extent that the headquarters hotel would undoubtedly be crowded and this would mean difficulty in securing accommodations, as well as meeting rooms.

"Dean Kagy has taken this matter up with the members of the local committee, including Mr. Carl Weeks, and others, and the local committee strongly advises a change in our meeting date, so as to avoid a conflict with the state fair.

"Under date of January 31st, Dean Kagy writes that the local committee has recommended to the Council of the A. PH. A. that the date be set forward to August 24th. This will run the convention into the first two or three dates of the fair, but as these days are largely preliminary, will not in any way interfere with the work of the A. PH. A. Neither will it interfere with hotel accommodations.

"Under date of February 12th Mr. Carl Weeks wrote to Dean Kagy: 'There are certain other advantages to the meeting being a week earlier which carry considerable weight. During fair week the town is crowded and the retailers who would take certain interest in this are more or less busy and we ourselves are more or less tied up at the fair. If it is possible to do so by changing the meeting date to August 24th, the boys will receive as fine hotel accommodations as can be had anywhere. They will have an opportunity, which many of

them will like to take advantage of, of attending the most interesting state fair in the Union and we will be free to turn loose on entertainment.'

"I have brought the proposed change to the attention of Dean Jordan, Chairman of the Executive Committee of the American Conference of Pharmaceutical Faculties, who writes: 'I think it would be much better to push the meeting forward a week than to attempt to hold it during the Iowa State Fair. In fact I believe August 24th is a better date for the meeting than August 31st. A number of the schools open early in September, and it is difficult for the faculty to return in time to handle many important questions.'

"I have also had a conference with Secretary Christensen of the National Association of Boards of Pharmacy, who informs me that this meeting date will be acceptable to his organization.

"I would ask you therefore, to place before the Council a motion to change the meeting date from week beginning August 31st to the week beginning August 24th.

Yours very truly,
WM. B. DAY, *Secretary.*"

(*Motion No. 28.*) *It is moved by Day that the date of the seventy-third annual convention of the A. Ph. A. to be held at Des Moines, Iowa, be changed from the week beginning August 31 to the week beginning August 24.*

56. Affiliation with American Association for the Advancement of Science. The following communication has been received from Secretary Day:

"DEAR DR. FISCHELIS:

"In accord with the action of the Executive Committee, I wrote to the Permanent Secretary of the American Association for the Advancement of Science as follows:

"The American Pharmaceutical Association through its Council desires to become associated with the American Association for the advancement of Science. We understand that application should be made to you as Permanent Secretary and that you will then submit it to your Council.

"I am sending you under separate cover a copy of our Year Book, giving the constitution and by-laws of our Association and a list of our membership; also, a copy of our monthly JOURNAL for January 1925 and a program of our last annual meeting and a brief historical sketch of our Association reprinted from the Druggists Circular.

"A number of our prominent members are already members of the American Association for the Advancement of Science including Dr. H. V. Arny of New York, Dr. H. M. Whelpley of St. Louis, Dr. J. H. Beal of Urbana, Dr. C. H. LaWall of Philadelphia, Dr. R. P. Fischelis of Newark, Dr. A. G. DuMez of Washington, D. C., Mr. E. G. Eberle of Philadelphia, Dr. E. F. Kelly of Baltimore, and many others.

"Will you please inform me what further steps are necessary so that our SOCIETY may be associated with the American Association for the Advancement of Science?"

to which I have the following reply:

"Your letter of February 18th is at hand, with suggestions concerning the possible affiliation of the American Pharmaceutical Association with the American Association for the Advancement of Science. I shall be very glad to bring this application before the Executive Committee of the American Association at its spring meeting which will occur in April.

"I think nothing further is necessary on your part and I hope that this affiliation may be ratified by the Executive Committee in April.

"I suggest that you include this correspondence in your next Council Letter for the information of the members of the Council.

Yours very truly,
WM. B. DAY, *Secretary.*"

57. Call for Nominations for Full-time Secretary. In accordance with the action of the Executive Committee of the Council the members of the Council are requested to send to the Secretary of the Council names of nominees for the full-time Secretaryship of the A. PH. A. The Council is to nominate a candidate for this office by mail ballot from among the names submitted, prior to April 15. In order to do this, nominations should be in the Secretary's hands not later than April 5.

58. Applicants for membership. The following applications accompanied by first year's dues and proper endorsements have been received.

No. 124, C. H. Bauer, Delaware Ave. & Mifflin St., Phila., Pa.; No. 125, Marion Brinston, 556 E. 60th St., Seattle, Wash.; No. 126, W. H. Crow, 114 Liberty St., New York City; No. 127, Clementine Claire Evans,

1121—34th Ave., Seattle, Wash.; No. 128, Arthur Abe Greenberg, 2754 Washington St., Seattle, Wash.; No. 129, Harry Lee Hamsher, 610 So. Union St., Ada, Ohio; No. 130, Evelyn L. Jorgensen, 4524—17th Ave., N. E., Seattle, Wash.; No. 131, Charles H. Lewis, 114—24th Ave., No., Seattle, Wash.; No. 132, Arnold Nydegger, 3105 Library Ave., Cleveland, Ohio; No. 133, Paul P. Palpal-latoc, University Y. M. C. A., Seattle, Wash.; No. 134, Anson Payne, 4554—16th Ave., N. W., Seattle, Wash.; No. 135, Abigail Poole, 4408 West Graham St., Seattle, Wash.; No. 136, Fleet H. Scroggs, Chapel Hill, N. C.; No. 137, Peter High Callicott, Stuttgart, Ark.; No. 138, Francis Duemmling, 14 Tufts St., Medford, Mass.; No. 139, Charles Z. Erdmann, Jr., 70 St. Stephen St., Boston, Mass.; No. 140, Ray Stanley Kelley, 93 Binney St., Boston, Mass.; No. 141, Albert Chas. Moreau, 90 Cypress St., Brookline, Mass.; No. 142, John Stanley Richards, 90 Cypress St., Brookline, Mass.; No. 143, Leonora Blanchard, 4311 Brooklyn Ave., Seattle, Wash.; No. 144, Lincoln W. Fraser, Lander Hall, U. of W., Seattle, Wash.; No. 145, Samson Goodglick, 2820 Mt. St. Helens Place, Seattle, Wash.; No. 146, Samuel W. Grant, 510 E. Pine St., Seattle, Wash.; No. 147, L. E. Hufford, Y. M. C. A., Seattle, Wash.; No. 148, Lawrence L. Miller, 1509 Linden Ave., Baltimore, Md.; No. 149, Percy O. Olson, 4518—17th Ave., N. E., Seattle, Wash.; No. 150, Albert J. Peha, 3103—E. Spruce St., Seattle, Wash.; No. 151, Morton Seidenfeld, 1812 E. 55th St., Seattle, Wash.; No. 152, Samuel Shapiro, 938 N. Robey St., Chicago, Ill.; No. 153, Sol Levinson, 2008 Washington St., Seattle, Wash.; No. 154, Frank Day, 1200—11th Ave., Bremerton, Wash.; No. 155, Wm. D. Ellis, 412 B. St., Chapel Hill, N. C.; No. 156, Wm. L. B. Brittain, Cor. Madison Rd. & Gilmore Ave., Cincinnati, O.; No. 157, Felix P. Meroney, Chapel Hill, N. C.; No. 158, Guss Neville, Jr., 3 Pettigrew St., Chapel Hill, N. C.; No. 159, Albert R. Pruett, Sardis, Ga.; No. 160, Henry H. Stembridge, Waynesboro, Ga.; No. 161, Lee S. Coy, 331 So. Johnson St., Iowa City, Ia.; No. 162, Julian L. Baker, Chapel Hill, N. C.; No. 163, Joseph P. Barbour, Chapel Hill, N. C.; No. 164, Geo. G. Buchanan, 412 Grimes St., Chapel Hill, N. C.; No. 165, Joseph A. Bullock, Chapel Hill, N. C.; No. 166, Wade A. Williom, Chapel Hill, N. C.; No. 167, Wilker J. Lindeman, Chapel Hill, N. C.; No. 168, Fred A. Nadler, 1800 Baymiller St., Cincinnati, Ohio; No. 169, Henry Dusterberg, 1218 Broadway, Cincinnati, Ohio; No. 170, J. H. Dornheggen, 2530 Eastern Ave., Cincinnati, Ohio; No. 171, Joseph Polonsky, 663 Howard Ave., Brooklyn, N. Y.; No. 172, Claude Rountree, Boston, Ga.; No. 173, Ira H. Jewell, 224 No. Clinton St., Chicago, Ill.; No. 174, Nicholas S. Gesoalde, 395 Graham Ave., Brooklyn, N. Y.; No. 175, Walter C. Ehmhack, 275 No. High St., Chillicothe, Ohio; No. 176, Edw. Chas. White, 537 Bloomfield St., Hoboken, N. J.; No. 177, Dr. Carl P. Sherwin, 41 Anderson St., Scarsdale, N. Y.; No. 178, Reuben Schwalberg, 1324 Carroll St., Brooklyn, N. Y.; No. 179, Jacob Rutes, 444 Howard Ave., Brooklyn, N. Y.; No. 180, Samuel Kidorf, 740 Washington St., Hoboken, N. J.; No. 181, John G. Gralf, 478 Westside Ave., Jersey City, N. J.; No. 182, Maurice De Bari, 200 Garden St., Hoboken, N. J.; No. 183, Joseph B. Carioti, 1036 Washington St., Hoboken, N. J.; No. 184, Joseph J. Blitzer, 1001 Willow Ave., Hoboken, N. J.; No. 185, Dr. Rodrige Jordan, Apartade 1424, Habana, Cuba; No. 186, Miss Lora Mae Smith, Tifton, Ga.; No. 187, Bruce W. Cruickshank, 4750—17th St., N. E., Seattle, Wash.; No. 188, Claude H. Disbrow, 4223—5th Ave., N. E., Seattle, Wash.; No. 189, Louis H. Green, 1111 No. 41st St., Philadelphia, Pa.; No. 190, Falton O. Garren, 102 Old East, Chapel Hill, N. C., No. 191, Wm. Allen Prout, School of Pharmacy, Tulane Univ., New Orleans, La.; No. 192; Matthew M. Dartt, 5079 Lincoln Ave., Chicago, Ill.; No. 193, Harry W. Brown, 503 E. Franklin St., Richmond, Va.

(*Motion No. 29.*) *Vote on applications for active membership in the American Pharmaceutical Association.*

59. Applicants for membership who have contributed to Building Fund. The following non-members of the A. Ph. A. have pledged a total of $25.00 or more to the building fund and have made a cash payment of $5.00 or more they are therefore entitled to membership in the A. Ph. A.

H-242, Charles E. Barnum, Chicago City, Minn.; H-243, Benj. Bernhaut, 112 Clinton Pl., Newark, N. J.; H-244, Jacob Bill, 1401 E. Creighton Ave., Ft. Wayne, Ind.; H-245, Stanley L. Campbell, Selma & Francis Aves., Halethorpe, Md.; H-246, Geo. C. Faust, 713 Main St., Scalp Level, Pa.; H-247, Pliny Fishburne, Waynesboro, Va.; H-248, James Hamilton, Main & Mechanic Sts., Englishtown, N. J.; H-249, F. H. Higgins, 1308 Rock St.,

Little Rock, Ark.; H-250, Wm. C. Kergel, 2191 Dayton Ave., St. Paul, Minn.; H-251, Andrew F. Ludwig, 2838 Edmondson Ave., Baltimore, Md.; H-252, Calvin J. Miller, 218 W. 4th St., Waterloo, Ia.; H-253, James E. Orr, Pendleton, S. C.; H-254, N. J. Segal, 8 No. Calvert St., Baltimore, Md.; H-255, Elmer L. Vehrencame, Calvert & 30th St., Baltimore, Md.; H-256, Frank J. Burke, Ohio, Ill.; H-257, F. L. Butler, 693 So. Main St., Lima, Ohio; H-258, Theo. Neal Crook, Box 88, Pangburn, Ark.; H-259, Eugene Cohen. 5933 Calumet Ave., Chicago, Ill.; H-260, Julia E. Emanual, 123 W. Wayne St., Ft. Wayne, Ind.; H-261, T. Bruce Furnival, 1123 S. Geddes St., Syracuse, N. Y.; H-262, Oliver J. Glenn, 3518 Princeton Ave., Chicago, Ill.; H-263, Burdette F. Hubbard, 32 E. Main St., Norwich, N. Y.; H-264, Harry Jensen, 815 Story St., Boone, Ia.; H-265, Ralph A. Jones, 815 Story St., Boone, Ia.; H-266, Chester C. Karr, 1717 E. Ninth St., Des Moines, Ia.; H-267, Harry L. Kendall, 1109 South St., Lafayette, Ind.; H-268, Joseph Lachs, 229 Keap St., Brooklyn, N. Y.; H-269, Melvin F. Lossman, 11925 Normal Ave., Chicago, Ill.; H-270, Alex S. Nachenberg, 1237 Independence Blvd., Chicago, Ill.; H-271, August C. Otto, 225 Grand Ave., Wisconsin Rapids, Wisc.; H-272, Edw. L. Sliney, 66 Revere St., Boston, Mass.; H-273, Clarence M. Taylor, Martinsville, Va.; H-274, John A. Trent, 631 No. Main St., Danville, Va.; H-275, Harry Yadkowsky, 1030—4½ St., S. W., Washington, D. C.; H-276, Louis E. Smolensky, 1101 E. Second St., Plainfield, N. J.; H-277, Ralph E. Reynolds, Rising Sun, Md.; H-278, Harold W. Rowland, 317 Lincoln Highway, Rochelle, Ill.; H-279, Martin F. Scheale, 526 Calhoun St., Ft. Wayne, Ind.; H-280, Morris Skor, 509 E. 35th St., Chicago, Ill.; H-281, Gus Reppert, 3501 Ingersoll Ave., Des Moines, Ia.; H-282, Carl F. Rehn, 3800—3rd St., Des Moines, Ia.; H-283, Alex F. Peterson, Jr., 816 Hilda Ave., Missoula, Mont.; H-284, Samuel M. Morewitz, 2411 Washington Ave., Newport News, Va.; H-285, Leslie J. Kocour, 4112 W. 21st Place, Chicago, Ill.; H-286, Andrew B. Jordan, Ridge Spring, S. C.; H-287, Walter G. Hohn, Pine City, Minn.; H-288, Philip K. Heldmann, 216 So. Warren St., Syracuse, N. Y.; H-289, Wm. H. Grothaus, 638 E. Commerce St., San Antonio, Texas; H-290, Paul J. Gregg, 6053 Ellis Ave., Chicago, Ill.; H-291, Stanley D. Graham, 116 Waldo St., Rockford, Ill.; H-292, James J. Goodwin, 572 S. 4th St., Louisville, Ky.; H-293, Geo. A. Geyer, 4827 Penn Ave., Pittsburgh, Pa.; H-294, V. M. Gaskins, Linn Grove, Ia.; H-295, Wm. D. Flaningam, 509 W. Union St., Champaign, Ill.; H-296, Chas. J. Epps, Conway, S. C.; H-297, Isaac E. Emerson, Emerson Hotel, Baltimore, Md.; H-298, Simon J. Codori, 5 W. Prospect Ave., Ingram, Pa.; H-299, Wm. Clift, Medical College of Va., Richmond, Va.; H-300, Robert H. Carlson, Lisbon, N. Dak.; H-301, Andrew V. Boos, c/o Winchester & Co., Mt. Vernon, N. Y.; H-302, Florence L. Bentz, 894 Michigan Ave., Buffalo, N. Y.; H-303, Harry F. AuBuchon, 5315 Harper Ave., Chicago, Ill.; H-304, Hubert T. Kroning St. Charles, Minn.; H-305, F. C. Schramm, 63 So. West Temple St., Salt Lake City, Utah; H-201, Willard C. Sanford, Jr., 162 Eugenie St., Chicago, Ill. (To take the place of John E. Thomas, previously listed at H-201); H-210, Earnest F. Robinson, Chapel Hill, N. C. (To take the place of Paschall M. Everts, previously listed as H-210); H-306, Frank L. Zaucha, 3234 N. Albany Ave., Chicago, Ill.; H-307, Herman A. Wilson, 2201 Washington St., Denver, Colo.; H-308, Donald D. Temple, 79 Main St., Hamburg, N. Y.; H-309, Alvah D. Ellsworth, Main St., Southampton, N. Y.; H-310, Miss Violet Davidson, Grafton, N. Dak.; H-311, Chas. Woul, 187 1st St., Elizabeth, N. J.; H-312, Mary Ferne Forsyth, 125 E. Main St., No. Manchester, Ind.; H-313, Fred A. Soleman, Tama, Iowa; H-314, H. L. Platt, Tama, Ia.; H-315, Fred Noble Wright, Federalsburg, Md.; H-316, Benj. Friedman, 417 Warren St., Boston, Mass.; H-317, Oscar J. Lundemo, Watkins, Minn.; H-318, James H. Howe, 319 So. 4th St., St. Louis, Mo.; H-319, Chas. Yalowich, 390 Joseph Ave., Rochester, N. Y.; H-320, Radford Royal, 332 Main St., Berkley, Va.; H-321, Abraham Caplan, 451–453 Church St., Norfolk, Va.; H-322, Louis Rubin, 1758 Washburne Ave., Chicago, Ill.; H-323, Wm. E. Wallace, 1020 N. Franklin St., Chicago, Ill.; H-324, H. P. Smith, Box 146, Stockdale, Texas; H-325, Harry Hogshead, Kalorama & New Sts., Staunton, Va.; H-326, Zeboim C. Patten, Jr., Chattanooga, Tenn.; H-327, Cecil D. Jay, Pawnee, Okla.; H-328, Aquilla Jackson, 3329 Beech Ave., Hampden, Baltimore, Md.; H-329, Alfred E. Thomas, 1400 6th Ave., Des Moines, Ia.; H-227, Walter D. Lamar, 238 Georgia Ave., Macon, Ga. (To take the place of Raymond F. Welch, previously listed as H-227); H-223, I. G. Brownell,

318 Grant Ave., Eveleth, Minn. (To take the place of Frederick Wm. Schoonmaker, previously listed as H-223).

(*Motion No. 30.*) *Vote on applications of contributors to building fund, for membership in the American Pharmaceutical Association.*

60. Applicants for Life Membership. Under the provision made by the Board of Directors of the A. PH. A. at a meeting held in Washington, D. C., December 7, 1923, a contributor to the Building Fund who subscribes $1000.00 or more is entitled to life membership. The following applications are submitted under this provision:

L. M. No. 6, Robert Suthers Sherwin, 149 Roseville Ave., Newark, N. J.; L. M. No. 7, Walter B. Swindell, Bayard & Russell St., Baltimore, Md.; L. M. No. 8, Ralph R. Patch, 25 Congress St., Stoneham, Mass.; L. M. No. 9, Frederic T. Fay, 79 Market St., Lowell, Mass.; L. M. No. 10, Robert R. Lampa, 202 Lake St., West Hoboken, N. J.; L. M. No. 11, Chas. W. Holton, 783 Broad St., Newark, N. J.; L. M. No. 12, John B. Thomas, Baltimore & Light Sts., Baltimore, Md.; L. M. No. 13, Ernst O. Engstrom, 77 Washington St., No., Boston, Mass.; L. M. No. 14, Carl Weeks, 124 Des Moines St., Des Moines, Ia.; L. M. No. 15, Clarence M. Kline, 105 N. Fifth St., Philadelphia, Pa.; L. M. No. 16, H. H. Robinson, 300—2 W. Lombard St., Baltimore, Md.; L. M. No. 17, Arthur L. Beardsley, 117 W. Franklin St., Elkhart, Ind.; L. M. No. 18, Chas. G. Merrell, 5th & Pike Sts., Cincinnati, Ohio; L. M. No. 19, Hilson H. Whyte, P. O. Box 1404, Philadelphia, Pa.

(*Motion No. 31.*) *Vote on applications for Life Membership in the American Pharmaceutical Association.*

ROBERT P. FISCHELIS,
Secretary of the Council.

Palestine Exhibition.—Palestine Pharmaceutical Association.

A Pharmaceutical Exhibition during Health Week in Palestine—President Haddad is shown in the picture. Another photo was received which exhibited a larger display, but was not sufficiently distinct to permit of reproduction. The report of the Association and the illustration indicate an interest in pharmaceutical affairs and advancement.

EDITORIAL NOTES

Editor: E. G. EBERLE, Bourse Building, Philadelphia, Pa.

Members of the Council, A. PH. A.: JAMES H. BEAL, *Chairman;* S. L. HILTON, *Vice-Chairman;* ROBERT P. FISCHELIS, *Secretary;* CHARLES H. LAWALL, HENRY M. WHELPLEY, H. V. ARNY, A. G. DUMEZ, CHARLES E. CASPARI, W. L. SCOVILLE. *Ex-Officio:* CHARLES W. HOLTON, President; Vice-Presidents, PAUL S. PITTENGER and WILLIAM MANSFIELD; WILLIAM B. DAY, Secretary; E. F. KELLY, Treasurer; W. BRUCE PHILIP, Chairman of the House of Delegates; Editors of the JOURNAL and YEAR BOOK: E. G. EBERLE AND A. G. DUMEZ. Committee on Publications: R. P. FISCHELIS, *Chairman;* H. V. ARNY, PAUL S. PITTENGER, E. F. KELLY, WM. B. DAY, A. G. DUMEZ, E. G. EBERLE.

Collaborators: The members of the Council; the Editor of the YEAR BOOK, A. G. DUMEZ; E. FULLERTON COOK, Chairman, U. S. P. Revision Committee; W. L. SCOVILLE, Chairman, N. F. Revision Committee; the Chairmen of the Sections, A. Ph. A.: PAUL S. PITTENGER, WILLIAM MANSFIELD, JOHN C. KRANTZ, JR., R. S. LEHMAN; W. BRUCE PHILIP, Chairman of the House of Delegates, A. Ph. A.; W. H. ZEIGLER, President A. C. P. F.; CHARLES B. JORDAN, Chairman Executive Committee, A. C. P. F.; H. LIONEL MEREDITH, President, N. A. B. P.; HENRY C. CHRISTENSEN, Secretary, N. A. B. P.

A CORRECTION, AND AN ADDITION.

The figure "2" in ninth line, p. 196, should be "3," and figure "3" in fifteenth line, p. 197, should be "2."

The following reference note applies to article on "A Palatable Cod Liver Oil Concentrate," on p. 215: "A brief history of cod liver oil as a remedy recently has been published by Dr. Ruth A. Guy, in the *Amer. J. Dis. Childr.*, 26, 122 (1923)."

PHARMACY AT THE SESQUI-CENTENNIAL.

Progress in the arts and sciences will be shown at the Sesqui-Centennial in Philadelphia next year. Few of the arts and sciences have made greater progress than pharmacy, which has a part in both. The first edition of the Pharmacopœia and the revision now being completed tell the history of progress in nearly all divisions of pharmaceutical art and science, for it must be remembered that pharmacy has its votaries in the wholesale as well as in the retail stores; in the manufacturing establishments and in the schools and colleges and all branches contributing to the materia medica.

The Headquarters Building will be representative of all the divisions of the drug business and the realization of that long hoped-for achievement will, within this period in history, mark an epoch for pharmacy. The history, progress and present status of pharmacy will have an interest for the public, as it touches life, health and civilization at many points; the history of medicine is incomplete without it.

Physicians in attendance at the A. M. A. meeting in Atlantic City will be made acquainted with the new standards, now being completed; this may serve, in a suggestive way, in the plans for the Sesqui-Centennial. American Pharmacy has a duty and an opportunity.

PHARMACEUTICAL CHEMISTS WANTED.

Receipt of applications for chemist (pharmaceutical) will close May 12. The examination is to fill a vacancy in the Bureau of Chemistry, Department of Agriculture, Washington, D. C., and vacancies in positions requiring similar qualifications.

The entrance salary for this position is $3800 a year. Advancement in pay may be made without change in assignment up to $5000 a year. Promotion to higher grades may be made in accordance with the civil service rules.

The duties are to conduct researches leading to the discovery of active plant principles in vegetable drugs and to develop procedures for the identification, isolation or separation of such constituents; also to develop methods of analysis for drugs; to modify existing methods of analysis for drugs for the purpose of making them more accurate; to coöperate with Government officials, with pharmaceutical chemists in the drug industry and with universities and colleges in the matter of research in the discovery and isolation of active principles in plants and the development and modification of methods for the analysis of drugs.

Competitors will not be required to report

for examination at any place, but will be rated on their education, training, and experience; and writings to be filed with the application.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil-service examiners at the post office or customhouse in any city.

REVISION OF THE ITALIAN PHARMACOPŒIA.

The Italian Minister of the Interior has appointed the Commission for revision of the Italian Pharmacopœia. The presiding officer is Professor G. Gaglio, director of the Institute of Materia Medica and Experimental Pharmacology in the University of Rome; the Commission includes three pharmacists: Dr. C. Chiappa, President of the Federation of Italian Pharmaceutical Associations; Cav. G. De Mercurio, President of the Pharmaceutical Association of Bologna; and Comm. Dr. A. Quercia, President of the Pharmaceutical Association of Bari.

FOUR LEPROSY CURES REPORTED.

Four men who entered the National Home for Lepers at Carrville, La., several years ago have been discharged as cured.

The United States Public Health Service announced that the men have been under close observation for a year.

Chaulmoogra oil was employed in the treatment of these cases, and other agents.

PHARMACY BULLETINS.

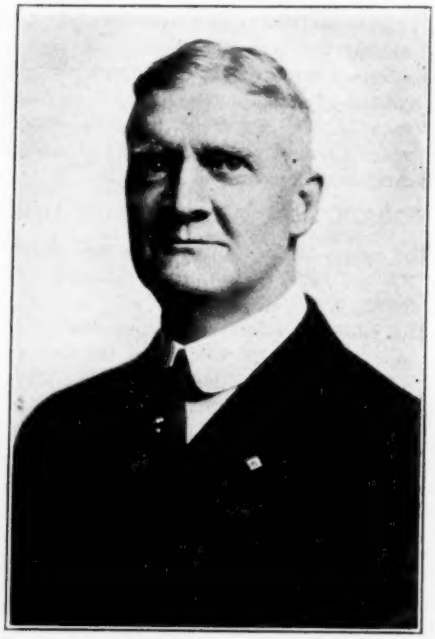
Bulletins promoting the interest in American Pharmacy Headquarters are being distributed. Every pharmacist has the opportunity of buying these from Publicity Director E. L. Newcomb. They are for display on the Bulletin Board, so that patrons of the store may know what pharmacists have achieved and what pharmacy is doing in health conservation, etc.

Excellent bulletins have been issued by the Northwestern Pharmaceutical Bureau; recent ones acquaint the public with sources of drugs and those who instruct young men and women in the science and art of pharmacy.

PERSONAL AND NEWS ITEMS.

About two hundred friends of **Dean Willis G. Gregory** assembled in the Lafayette Hotel at Buffalo, N. Y., March 28th, to do honor to the Dean upon completion of his thirty-fifth year in that capacity.

The record of service, time and work accomplished by Dean Gregory is deserving of the commemoration; it marks a milestone of this active worker for pharmacy, and there is reasonable assurance he will be given many more useful years. He has won the esteem and affection of faculty and Alumni and the high regard of co-workers.



DEAN WILLIS G. GREGORY.

The addresses of the occasion, besides the response by the guest of honor and impromptu remarks by others, were made by Chancellor Capen for the faculties; Hon. John Lord O'Brian for the Council, and Principal Frank S. Fosdick for the community. Dr. Gregory became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1886.

Sir William S. Glyn-Jones, honorary member of the AMERICAN PHARMACEUTICAL ASSOCIATION, Secretary and Registrar to the Pharmaceutical Society of Great Britain, etc., is at present in Canada, and he hopes to visit some of the cities in the United States, if time will permit. A sketch of the distinguished visitor is printed in the JOURNAL A. PH. A., for 1924, pp. 502–505. It is unnecessary to state that Sir William will receive a very cordial welcome from pharmacists of this country.

Paul S. Pittenger, formerly director of the Pharmacodynamic Research Laboratories of H. K. Mulford Co., is now the President of Harvey-Pittenger Co., recently incorporated for the manufacture of pharmaceutical specialties, endocrine products, etc. **Gilbert L. Harvey,** has served as instructor in Bacteriology at the Philadelphia College of Pharmacy and Science, and for many years as assistant director of the manufacturing departments of the National Drug Company.

Ex-President John Uri Lloyd has returned from a visit in California. He is recovering from illness and is again at his desk.

A card announcing the birth of Noel Dayton Lee at Nanking, China,[1] on Christmas Day, has been received. Mrs. Lee was Miss Esther M. Haggard of Wuhu, China. Professor Lee is now connected with Nanking University, and stated in his last communication that he would return to the United States this year. It will be recalled that Professor Lee was formerly of Purdue University and active in several of the A. PH. A. Sections.

Miss Eva Sabine Carr, Church General Hospital, American Church Mission, Wuchang, China, writes that the JOURNAL A. PH. A. is a welcome visitor. She is engaged in training young women for hospital work and in pharmacy, in addition to her duties as pharmacist in the Hospital.

Dr. Herbert Spencer Jennings, noted zoölogist of the Johns Hopkins University, was awarded the first Joseph Leidy Memorial Medal by the Philadelphia Academy of Natural Science. The award is in recognition of Dr. Jennings' study of the lower types of animal life, notably the Protozoa.

Bishop Charles H. Brent, one of the representatives of the United States at the recent International Narcotic Conference at Geneva, was awarded the Chancellor's Medal of the University of Buffalo on February 23rd. The award characterizes Bishop Brent as a citizen of Buffalo who has performed "a task of civic patriotism and public service."

A. M. Harrison, pharmacist of Murphysboro, states that his store was badly damaged during the storm, but none of his family were injured. Two other drug stores of Murphysboro were completely destroyed. The AMERICAN PHARMACEUTICAL ASSOCIATION has no other members in the storm area of Illinois. Ex-President John C. Wheatcroft, of Illinois Pharmaceutical Association, made a tour of the section visited by the storm, for the National Association of Retail Druggists.

Dr. Edgar Fahs Smith, of the University of Pennsylvania, has completed another sketch—an addition to the "Fathers of Chemistry"—John Griscom, 1774–1852. He was of the faculty of Rutgers College, taught chemistry, aided in the organization of medical faculty in 1812, he launched the New York High School, edited Irving's "Catechism of Practical Chemistry," etc. The following statement will be of interest—in 1830 Samuel Guthrie sent Griscom "a bottle of a newly discovered liquid which he called 'sweet whiskey;'—a lively, healthful and reviving cordial, delightfully sweet and aromatic." On the margin of Guthrie's letter Griscom wrote these words: "This is the first discovery of chloroform. I received the bottle and found it to answer to the description."

Frank X. Moerk gave a public lecture on March 19, at the Philadelphia College of Pharmacy and Science, on "Chemicals We Should Know." The lecture was illustrated by experiments and specimens and the attention of the audience was directed to the possible injury to property and health that may result from misuse or careless handling of these chemicals.

President-elect L. L. Walton, of the A. PH. A., spoke on "Flora of the Medicinal Plants of Pennsylvania," before the Garden Club of Williamsport, in Trinity House, March 7. The lecture was illustrated, and acquainted the audience with medicinal plants—those that are poisonous, and the value of some of the drug-yielding plants that are also ornamental. The address was well received and the local papers devoted considerable space to the presentation.

H. S. Noel delivered an interesting talk on "How to Make More Money Out of Retailing," before New York College of Pharmacy, on March 17; on March 18, Mr. Noel delivered an address before the Essex County (N. J.) Pharmaceutical Association, and on March 19, he spoke at the Brooklyn College of Pharmacy.

R. R. Lampa has yielded to the request of friends in printing the poem—"A Dream"—read before the Veteran Druggists' Association of New York, October 21, 1924.

Arthur D. Little, President of Arthur D. Little, Inc., of Boston, has been elected to succeed Charles H. Herty as chairman of the Advisory Committee of the Exposition of Chemical Industries.

[1] See JOUR. A. PH. A., July 1924, pp. 650–652.

As a tribute to the late **Howard B. French,** for many years President of the Philadelphia College of Pharmacy and Science, a tablet has been placed on the building occupied, as office, by Samuel H. French & Co., from 1852–1924. The building was built by John Penn.

A new war threatens the world, a war the extent of which defies the imagination, yet which might ultimately result in the complete extermination of the human race, in the opinion of Dr. L. O. Howard, chief of the Bureau of Entomology, Department of Agriculture. The fighting is already under way. Mankind apparently won the first phase, but the enemy seems to have the upper hand in the second phase which is just the beginning of the war. The battle is between men and insects.

Ex-President James H. Beal will be one of the principal speakers at the meeting of California Pharmaceutical Association, May 25–27.

James F. Ballard, head of several proprietary houses and well known in the wholesale drug trade, and as a collector of Oriental rugs, arrived in Paris in February after completing his second tour of the world since January, 1924. The Paris edition of the New York *Herald-Tribune* gave him front page space and went into details at some length of the many miles (some 400,000) he had traveled during the past twenty years in order to add to his collection. Several years ago Mr. Ballard presented more than one million dollars' worth of antique creations to the Metropolitan Museum of Art.

B. C. Tharp, candidate for the Ph.D. degree at the University of Texas, is writing his thesis on "Studies on the Ecology of East Texas Vegetation." In his search for data he has traveled over 15,000 miles.

Charles E. Matthews, of the Chicago office of Sharp & Dohme, has been spending a vacation in Miami, Fla.

John L. Herpich, for 40 years at 4th & Main Sts., Columbus, Ohio, recently opened a new store at Mount Vernon Ave. and Bolivar St.

Otto J. S. Boberg, Secretary of Wisconsin Pharmaceutical Association, says that a contribution to the American Pharmacy Headquarters' fund does not mean a donation, but an investment, beneficial to the progress and prestige of American pharmacy.

Mrs. W. W. McNeary, wife of our fellow member **W. Wilson McNeary,** Superintendent of the Polyclinic Hospital, Philadelphia, is recuperating after an operation, which detained her in the hospital for about four weeks.

Members of the A. PH. A. sympathize with **Robert J. Ruth,** former Chairman of the Section on Practical Pharmacy and Dispensing, in his bereavement. Mrs. Ruth died in a Milwaukee hospital, following an operation March 14.

BULLETINS OF THE DRUG TRADE BUREAU OF PUBLIC INFORMATION.

Director Robert P. Fischelis has issued further bulletins of the Drug Trade Bureau of Public Information.

Bulletin C-6 speaks of a plan being considered by the National Wholesale Druggists' Association for determining the salaries of salesmen according to results. The trend is toward a scale of commissions which increases in direct ratio with the profitableness of the merchandise sold. The bulletin also considers methods of handling, drawing accounts, etc.

Bulletin C-7 reports on the progress being made in the campaign for funds for the AMERICAN PHARMACEUTICAL Headquarters. The points brought out in this bulletin are that the druggists are organized for the purpose of having a larger number contribute thereto, and among the expressions abstracted from various comments are the following: "The headquarters will centralize research work, and upbuild a national pharmaceutical library and museum." President Holton says that "it will foster fuller recognition of pharmacy, and that the result will influence greatly the welfare of druggists as well as the committee." R. T. Ellis, of Memphis, says that "the drug industry has permitted itself to be the door-mat of professional and commercial life too long. The drug trade has been too tardy and too narrow in its views." The splendid coöperation of the national and state bodies is then referred to.

Bulletin C-8 analyzes the report by Dr. Robert P. Fischelis, Dean of the New Jersey College of Pharmacy, to the American Conference of Pharmaceutical Faculties. The advanced conditions of education are analyzed and the progress made pointed out. He states that the drug stores where students of pharmacy can now obtain real professional training are few in number because the tendency to departmentize drug stores has had the effect of bringing the student clerk to the sales counter. The installation of modern business methods in the retail pharmacy practically requires the elimination of the training features of the store. The bulletin closes with requirements relating to pharmacy in New York State.

Bulletin C-9 differs from other bulletins in that it is regional in scope, and this one relates

to the efforts being made in Wisconsin for the AMERICAN PHARMACEUTICAL ASSOCIATION Headquarters Building. The point made in the campaign refers to the possibilities of the research laboratories, the library and the museum in the building. In this connection, it might be said that Wisconsin aspires to have the Headquarters Building located either in Madison or in Milwaukee.

Bulletin C-10 refers to promiscuous use of poison labels to the extent that it will have an untoward influence; that is, the wide use of a poison label fails to impress the individual so that it ceases to be an effective warning. The reference is chiefly to the action taken at the last meeting of the National Drug Trade Conference.

The concluding paragraph of this bulletin reads:

"The use in legislative enactment of such general descriptive phrases as 'all other poisons,' or 'all other substances of similar or equivalent properties' are highly objectionable both from a scientific and from a practical standpoint."

Bulletin C-11 was accompanied by a photograph of Charles W. Holton, President of the AMERICAN PHARMACEUTICAL ASSOCIATION, and the occasion was the testimonial dinner tendered to him at Newark.

Bulletin C-12 urges consideration of price regulation measures, and the arguments presented are those of various national associations.

Bulletin C-13 refers to several articles dealing with medicinal plant gardens, and specifically the article by Prof. C. J. Zufall, printed in the JOURNAL of the AMERICAN PHARMACEUTICAL ASSOCIATION for January on pp. 26 to 28.

Bulletin C-14 relates to the election of the officers of the AMERICAN PHARMACEUTICAL ASSOCIATION, and also the progress made in the pharmacy Headquarters Fund.

Bulletin C-15 relates to a national pharmaceutical museum, a national pharmaceutical library, and the Dohme Memorial Research Library to be established at the headquarters. Quotations from various articles are given.

Bulletin C-16 relates to the meeting of the American Drug Manufacturers' Association to be held in New York City at the Hotel Biltmore on April 20th. Surgeon General M. W. Ireland is to be one of the speakers of note. Prof. W. E. Freeland of the Massachusetts Institute of Technology will discuss "The Scientific Approach to the Solution of Marketing Problems." Dr. Ralph E. Heilman, Dean of Northwestern University School of Commerce, will speak on "Government and Industry," and Editor Morris Fishbein of the *Journal of the American Medical Association*, will outline "Trends in Therapeutic Research." Further references are made to the program of the organization named.

ALL-COMMUNITY HEALTH PAGEANT IN CHICAGO.

The all-community health pageant held at the Midway Masonic Temple, under the joint sponsorship of the Jackson Park Branch of the Chicago Medical Society and the second district Illinois Federation of Women's Clubs, with the Chicago Dental Society, the Chicago Retail Druggists' Association, the Chicago Health Department and the Illinois State Department of Health coöperating, was a step forward in community education. U. S. P. and N. F. preparations were on display, with literature, in the C. R. D. A. booth. Samuel C. Henry, Secretary of the N. A. R. D., delivered an address entitled "New Lights on Old Issues." He took advantage of this opportunity to bring home to his auditors the fact that the drug store is an establishment essential to the welfare of every community and pointed out the remarkable development which pharmacy as a science has shown during the past century.

STATUE OF BALTO FOR CENTRAL PARK.

Funds are being raised to place a statue of Alaska's dog hero in Central Park, New York City. The dog is certainly a faithful animal and the fact that dog teams brought hope and remedial agents to the afflicted, adds to human interest.

Some objection is being raised to the move under the supposition that it is propaganda; certainly no such thoughts prompted the firms when the appeal for help came. In the same daily paper in which the objection was printed there appeared an article on a treatment by a physician of high repute; that is, the item gave an account of his statement regarding the treatment. Some might consider this propaganda—we do not. Pharmaceutical manufacturers conform to a code of ethics which is deserving of commendation.

OBITUARY.

HENRY A. JORDEN.

Henry A. Jorden, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1902, died at his home in Bridgeton, N. J., March 10. He was formerly a member of the New Jersey Board of Pharmacy and also, for a time, its Secretary; for many years he was active in the State Association. He graduated from the Philadelphia College of Pharmacy in 1868, and was engaged in business up to the time of his death. He held a wide acquaintance among pharmacists and was highly regarded in his home city. Mr. Jorden is survived by his widow.

PROFESSOR AUGUST VON WASSERMANN.

A Berlin dispatch, of March 18, states that the death of August von Wassermann removes the last of the four great scientists—Koch, Ehrlich, Behring and Wassermann—who established the leadership of Germany in the investigation and treatment of infectious diseases. No successor is at hand to take the place of the discoverer of the epoch-making Wassermann reaction, which entitled him to historical equality with Koch, who was the first to isolate the infectious protozoa of syphilis; Ehrlich, the inventor of salvarsan, and Behring, the finder of a diphtheria serum. It was the fate of the great researcher to die of a disease—organic kidney trouble—not yet touched by a gifted hand like his.

Though perhaps the most renowned of medical men in this decade, Dr. Wassermann never practiced medicine. His private fortune allowed him to dedicate his entire time to the laboratory.

Not very long before his death it was announced that he had determined a new blood test by which, it is hoped, cancer can be detected long in advance of present methods.

Professor Wassermann was director of the Kaiser Wilhelm Institute for Experimental Therapy and professor of medicine at the University of Berlin. He was born in Hamburg in 1886. He studied medicine at Berlin, Strasbourg, Erlangen, Munich and elsewhere, becoming an assistant professor at the Koch Institute of the Charite, in Berlin, following the completion of his studies. He became an assistant professor of therapeutics in the University of Berlin in 1902, later being advanced to a full professorship in 1911.

In 1913 he was appointed director of the newly-founded Institute for Experimental Therapy in Berlin. It was in 1906, while an assistant professor in the University of Berlin, he made his discoveries which led to the universal blood test which bears his name.

In March, 1923, Dr. Wassermann announced the discovery of a method of determining the presence in the body of what he termed "latent active tuberculosis."

B. A. Parsons, sales manager of Parke, Davis & Company, died suddenly March 19, at his home in Detroit. Pneumonia complicated with pulmonary embolism caused his death.

He is survived by his wife, Margaret Stimpson Parsons, a married son, Stuart O., living in Ohio, and a daughter, Helen M., attending the Liggett School. Mr. Parsons was 49 years old at the time of his death. He was born in Maple Valley, Michigan. Coming from the University of Michigan, he entered the employ of Parke, Davis & Company thirty years ago. Before being made sales manager two years ago, he held the position of manager of the Kansas City branch of Parke, Davis & Company. During his residence in Kansas City he was prominent in civic affairs, being at one time police commissioner and at another President of the Kansas City board of commerce.

SOCIETIES AND COLLEGES.

A. PH. A. DRIVE FOR HEADQUARTERS IN NEW YORK CITY.

Retail pharmacists in Greater New York have an opportunity, during a three-month period which began on March 15, to contribute to the Headquarters' Building Fund of the AMERICAN PHARMACEUTICAL ASSOCIATION. Pharmacists in the Greater City, to date, have not "gone over the top" in the matter of contributions to the fund and this special drive has been arranged to make it possible for them to do so.

Nathaniel Nicolai is directing the drive and, under his supervision, a corps of solicitors is calling upon retailers throughout the city. The committee appointed several months ago to collect funds in New York will continue to function under the direction of Chairman Robert R. Lampa and will coöperate with Mr.

Nicolai when the time comes to approach manufacturers, wholesalers and others who are interested in establishing a permanent headquarters for the A. PH. A.

The project has the endorsement of practically every local, state and national pharmaceutical association in America and more than $400,000 of the $1,000,000 required to establish the headquarters has already been raised. It is confidently expected that the drive in New York will place the City in the hundred per cent class so far as its quota is concerned.

The campaign committee for New York includes Robert R. Lampa, Chairman; Nathaniel Nicolai, Director of the drive; Clyde L. Eddy, Treasurer; H. V. Arny, J. Leon Lascoff, H. B. Smith, Robert S. Lehman and S. S. Dworkin. From *Pharmaceutical Era.*

April 17 is Campaign Day throughout the United States—see editorial pages of this issue.

NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

A census of salesmen in the wholesale drug trade has been compiled by C. H. Waterbury, Secretary of the National Wholesale Druggists' Association, and published by the association. The booklet lists the number of city, country, specialty and inside salesmen employed by each wholesale firm and enumerates the States covered regularly and part time.

A large size cloth-backed map, showing the points in which wholesale drug members are located also has been prepared. It shows not only the number and location of wholesale drug houses, the number of salesmen employed, but also gives the number of retail pharmacists in each state.

The Committee on Arrangements and Entertainment for the Fifty-first Regular Meeting of the National Wholesale Druggists' Association at the Book-Cadillac Hotel, Detroit, Mich., during the week of October 4, 1925, is completing its organization.

AMERICAN CHEMICAL SOCIETY.

The spring meeting of the American Chemical Society was held April 6 to 10 at Baltimore, with most of the sessions at Johns Hopkins University and the Emerson Hotel. The programs of the general sessions and the divisional meetings offered a wide variety of subjects which were dealt with in papers and discussions by leaders in the various fields.

Papers of the Division of Chemistry of Medicinal Products follow: "Chemistry in the Field of Micro-Biology;" "Application of the Methods of Organic Chemistry to the Study of the Structure and Composition of Bacteria," by Dr. T. B. Johnson; "Chemical Aspect of the Therapeutic Action of Arsenicals," by Dr. Carl Voegtlin; "The Significance of the Selective Bacteriostatic Properties of the Aniline Dyes," by Dr. John W. Churchman; "The Significance of Hexylresorcinol and Its Homologues in Relation to the Problem of Internal Antisepsis," by Dr. Veader Leonard; "Bacterial Chemotherapy with Special Reference to Mercury Dyestuffs," by Dr. Geo. W. Raiziss.

CENTENARY OF JEFFERSON MEDICAL COLLEGE.

The Democratic Press of March 24, 1825, reported in a news item that "On the 8th inst. the Jefferson Medical College was opened in this city (Philadelphia) with a public address by one of the medical professors, B. Rush Rhees, M.D. The address having for its object the exposition of the plan of this newly established institution."

The "Philadelphia Evening Ledger" of recent date, said that "The school was founded by Dr. George McClellan, with a faculty of six, in 1825. It was at that time a constituent part of Jefferson College, which has since been changed to Washington and Jefferson University, Cannonsburg, Pa. Associated with Dr. McClellen in the early work of the college were Drs. John Eberle, Joseph Klapp, and Jacob Green."

The celebration will open on May 29th, during the week following the meeting of American Medical Association.

AMERICAN MEDICAL ASSOCIATION.

The American Medical Association meets in annual session in Atlantic City, May 25–29. The Pharmacopœia X, in its revision forms, will be on display at the convention, together with a more or less complete line of its materia medica, including pharmaceutical and chemical preparations.

The *Journal A. M. A.*, of March 28, is a comprehensive and interesting hospital number.

MINNESOTA PHARMACEUTICAL ASSOCIATION VOTES FOR OFFICERS BY MAIL.

The names of the following nominees have been sent to members of Minnesota Pharma-

ceutical Association—one to be elected for each office—President, John B. Christgau, Owatonna; Emil T. Schmidt, Buffalo. First Vice-President, Paul H. Stucky, Waseca; Francis W. Moudry, Minneapolis. Second Vice-President, A. L. Malmo, Duluth; Albin C. Carlson, Willmar. Third Vice-President, Miss Jacobi Roes, St. Paul; Guy K. Wold, Austin. Secretary, Gustav Bachman, Minneapolis; L. E. Seiberlich, St. Paul. Treasurer, H. Martin Johnson, St. Paul; G. H. Countryman, Fergus Falls. Executive Committee, C. D. Johnson, Brainerd; Theo. A. Kustermann, Minneapolis.

NEW JERSEY PHARMACEUTICAL ASSOCIATION COUNSELS ITS MEMBERS.

Mimeo 5-C, New Jersey Pharmaceutical Association, issued March 17, presents notices of the Board of Pharmacy to its members. Pharmacists are cautioned relative to proper keeping of spirit of nitrous ether and lime water, and are advised that the names of the registered pharmacists in pharmacies must be displayed so the same may be seen and easily read from the outside, and that the Poison Register must be properly kept and "poisons" labeled in accordance with the law.

CINCINNATI COLLEGE WILL CELEBRATE ITS 75th ANNIVERSARY.

Plans are being perfected for the celebration of the 75th anniversary of the founding of the Cincinnati College of Pharmacy. Several days of commencement week will be given over to the celebration; the "reunion banquet" will be held June 2, in Hotel Gibson Roof Garden. More than 500 have signified their intention to be present. The Actuary, Prof. C. T. P. Fennel, enters his 40th year of membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

UNIVERSITY OF ILLINOIS COLLEGE OF PHARMACY.

The University of Illinois College of Pharmacy expects an appropriation from the Legislature of $350,000 for a new pharmacy building.

The campaign for a new Student Y. M. C. A. building has been successful. This will add much to the west side medical center, and provides lodgings for students and extends gymnasium facilities.

ST. LOUIS COLLEGE OF PHARMACY.

Students and faculty celebrated the 50th anniversary of Prof. Francis Hemm's graduation from St. Louis College of Pharmacy, which is also the 44th year of his connection with the teaching staff—on March 30th. Engrossed resolutions were presented to him and also gifts in which members of the faculty and student body were represented.

A survey has been completed which has served in the preparation of the curriculum for the 3-year course. A physical survey also will be made of the retail drug stores, so as to determine how the College can best serve.

THE THREE-YEAR CURRICULUM.

Most of the pharmacy schools have completed preparations for the minimum 3-year course in pharmacy; a number have instituted such a course and a few have advanced beyond these requirements. Doubtless some changes will be necessary before uniformity is established and the plans work satisfactorily.

A schedule of hours and subjects (Adopted February 12) has been sent in by Dean Rudd of the Medical College of Virginia School of Pharmacy; to this will be added—training in the "College Practice Drug Store" and "Dispensing Laboratory Work;" sufficient time will be allowed each student during his course to become proficient in these subjects.

Schedule of hours and subjects—Virginia School of Pharmacy 3-Year Course.

Name of course.	Hours per Week: First Quarter D	First Quarter L	Second Quarter D	Second Quarter L	Third Quarter D	Third Quarter L	Fourth Quarter D	Fourth Quarter L	Total Hours: Didac.	Lab.	Ttl.
First year—											
Biology, general	1	2	1	2	1	2	1	2	32	64	96
Chemistry, general	3	4	3	4	3	4	..	..	72	96	168
Chemistry, qual.	..	..	..	..	..	..	3	6	24	48	72
History of pharm.	1	..	1	..	..	..	..	..	16	..	16
Theory of pharmacy	3	4	3	4	..	..	..	..	48	64	112
Mfg. pharmacy	..	..	..	..	3	4	3	4	48	64	112
Mathematics, phar.	2	..	2	..	2	..	2	..	64	..	64
Latin, phar.	..	..	..	..	1	..	1	..	16	..	16
English	3	..	3	..	3	..	3	..	96	..	96
Total	13	10	13	10	13	10	13	12	416	336	752
Second year—											
Physiology	..	..	..	..	2	2	2	2	32	32	64
Phar. botany	1	2	1	2	1	2	1	2	32	64	96
Materia medica I.	2	..	2	..	2	..	2	..	64	..	64
Chemistry, quant.	2	6	..	..	..	..	..	..	16	48	64
Chemistry, organic	..	..	3	2	3	4	3	4	72	80	152
Mfg. pharmacy	2	2	2	2	2	2	2	2	64	64	128
Disp. pharmacy	1	..	1	..	2	..	2	..	48	..	48
Com'l pharmacy I.	2	..	2	..	2	..	2	..	64	..	64
Physics (heat, elec.)	3	4	3	4	..	..	..	..	48	64	112
Total	13	14	14	10	14	10	14	10	440	352	792
Third year—											
Pharmacognosy	1	2	1	2	1	2	1	2	32	64	96
Pharmacology	..	..	..	..	3	4	3	4	48	64	112
First aid	1	..	1	..	..	..	..	..	16	..	16
Bacteriology	..	..	..	2	6	2	6	32	96	128	
Materia medica II.	2	..	2	..	2	..	2	..	64	..	64
Biochemistry	2	4	2	4	..	..	..	..	32	64	96
Theoretical chem.	..	..	..	..	2	..	2	..	32	..	32
Com'l pharmacy II.	3	..	3	..	..	..	..	..	48	..	48
Economics) Pharmacy	2	..	2	..	2	2	2	2	64	32	96
Government and citizenship	2	..	2	..	..	..	..	..	32	..	32
Total	13	6	13	6	12	14	12	14	400	320	720

ANNUAL MEETING OF THE PALESTINE PHARMACEUTICAL ASSOCIATION.

The annual meeting of the Jerusalem Branch of the Palestine Pharmaceutical Association was held February 3, at Bristol Garden. President Farid Haddad presided and gave an outline of the program.

Secretary Jacob Michlin presented a report of the activities of the Associations of the Conference of Palestine pharmacists in Jaffa; results of the interview with the Director of Health relative to poison regulations—simplification of the Poison Register. The Secretary also referred to various exhibits in pharmacies during Health Week; the establishment of a pharmaceutical journal, etc.

Treasurer M. Hausdorf made a report, and the two foregoing reports were discussed by Messrs. Koswinier, Carnapas, Oplatka, Barouch, and others.

A plan for a central establishment for the manufacture of galenical preparations was discussed and also a general price current on drugs and pharmaceuticals.

The Executive Committee for 1925 consists of Messrs. F. Haddad, M. Hausdorf, J. Michlin, E. Oplatka, I. Halaby, S. Carnapas, and A. Koswinier.

Following adjournment a reception was tendered Secretary Jacob Michlin and his fiancé by Mr. and Mrs. Anton Halaby at their home, to which the membership were invited.

PLANS TO REORGANIZE JOHNS HOPKINS UNIVERSITY.

Plans are being considered for the reorganization of Johns Hopkins University by the abolition of the first two years of college work and devotion of the University entirely to graduate study and research.

The great reputation of Johns Hopkins University, and of Johns Hopkins Hospital, was largely won in the field of original research. The half-century committee is attempting to raise upwards of $10,000,000 for the two institutions, and expects to expend large amounts of money annually to further research. The chairman of the committee having this in charge is Daniel Willard, and he has announced the first gift toward the special research fund, which was made through H. A. B. Dunning, a member of the half-century committee. The interest on this subscription is to be used for research in the departments of ıtrology and pharmacology.

It is contended by some that there should be places where higher learning can be acquired, and such places cannot function successfully if they must also teach branches whose only object is to increase earning power. It remains to be seen whether the venture will be successful. It certainly will be if the endowment is sufficiently large. The greater number of institutions will, probably, always continue their line of work as at present. There may be a suggestion in this, that there are possibilities for schools of pharmacy that devote their energies largely to the business side of pharmacy, and others that will make a specialty of research and preparing the students for clinical laboratory work and for the pharmaceutical manufacturing industries.

PHARMACEUTICAL MANUFACTURERS TO MEET AT WHITE SULPHUR SPRINGS.

The Eighteenth Annual Meeting of the American Pharmaceutical Manufacturers' Association will be held in White Sulphur Springs, W. Va., the week of June 22nd, of this year. Headquarters will be at the Greenbrier Hotel. This meeting place is very accessible, being on the main line of the Chesapeake and Ohio Railway.

Greenbrier Hotel.

A program of unusual interest is being arranged, including the annual golf tournament for the Monsanto Cup.

The following officers and directors were elected at the last Annual Meeting to serve in 1925:

President, J. H. Foy, Newark, N. J.; *Vice-President*, F. A. Mallett, Des, Moines, Ia.; *Vice-President*, G. A.Kinsel, Saratoga Springs, N. Y.; *Secretary-Treasurer*, R. R. Patch, Boston, Mass.; *Board of Directors:* C. N. Angst, C. H. Searle, C. D. Smith, G. C. Pratt, S. De Witt Clough, H. F. Snider, R. M. Cain, H. B. Johnson, R. L. McNeil.

THE AMERICAN PHARMACISTS' EUROPEAN TOUR.

Reference has been made in several issues of the JOURNAL to the tour of American pharmacists, who will visit Germany, Austria and Switzerland this summer, and indications point to a party of not less than 150. The program of the trip has been arranged, and among the

events scheduled is an address before the German Apothecaries' Association in Berlin, by Prof. Curt P. Wimmer of the New York College of Pharmacy. An invitation has been extended by the Wellcome Historical Museum to visit that institution in London, and it is expected that quite a number of the party will avail themselves of this opportunity.

Inquiries relative to the tour can be addressed to Editor Hugo Kantrowitz, of the *Apotheker Zeitung*, 104 John Street, New York City, under whose auspices it has been planned.

THE PHARMACIST AND THE LAW.

CONGRESSIONAL ACTIVITY IN LEGISLATION.

The last Congress enacted 632 public laws and 75 resolutions. Congressman Ramseyer, of Iowa, has reviewed the work of Congress during 136 years—more than 50,000 laws and resolutions have been passed, covering 48,000 pages in the statute books. Far more legislation has been enacted because legislative measures are frequently passed as riders to appropriation bills, and pension bills are often combined in one measure.

The number of the last House bill, in Pennsylvania, is 1649, but included in this are 289 Senate bills that take the House numerals when messaged from the Senate to the House. These facts are stated so that an idea may be had as to how much we must remember for—ignorance of the law excuses no one.

STATE LEGISLATION.

A bill has been introduced to amend the pharmacy law of Arizona, exempting grocers and general dealers from its provisions. If passed, this would regulate pharmacists, who are qualified, but those *not qualified* would not be restricted. The present pharmacy and poison law would become a source of danger, if the amendment passes, but it is hardly probable that the Governor would sanction such legislation.

A Senate bill in Arkansas provides for registration of drug stores and pharmacies, and registered pharmacists must continuously be in charge.

In California, a judge held an employee liable—*for possession* of Jamaica Ginger (intoxicating beverage); the owner was absent and the judge's opinion did not hold that the employee had paid for the Jamaica Ginger any more than for any other items of the stock; the owner had expressly or impliedly authorized the employees to sell the Jamaica Ginger.

A bill of Delaware Legislature makes it unlawful and punishable by imprisonment up to one year and a fine up to $500 for a person to be found with any intoxicating liquor in his possession. The present State law allows a person to have one quart of liquor.

Idaho Legislature has passed a bill providing that two years' college training and two years' practical experience shall be required as a prerequisite to the registration of pharmacists. Another bill regulates the sale, giving away and transfer of denatured alcohol. A bill in Kansas Legislature delegates the appointing power of members of the Board of Pharmacy, without reference to the recommendations of the State Association.

A Massachusetts measure places the sale of all hair dyes under the supervision of the Department of Public Health.

Senator Horatio S. Karcher, a druggist and member of Michigan Legislature, has introduced an "ownership bill"—restricting ownership to pharmacists, whether in a company or corporation. Provision is made for the continuance of present corporations but no new companies can engage unless all conditions of the bill are met.

A bill of Missouri Legislature seeks to restrict the sale of *all* medicines containing coal-tar derivatives to registered pharmacists; a number of the foregoing are named, as acetanilid, aspirin, phenol, etc.

Governor Silzer (New Jersey), has signed Assembly Bill 54. The bill is an amendment to the present pharmacy law and under its provisions the requirements for candidates for assistant registration will be raised to include four years of high school and the completion of at least one year in a school of pharmacy recognized by the Board. The fee for registration as assistant pharmacist is raised to $10 and hereafter each candidate appearing before the Board for either full registration or assistants' licenses will have to be either a citizen of the United States or have declared his intentions. Under the provision of the amendment candidates will have to pay an additional fee for re-examination and the war-time service clause of the Pharmacy Act is repealed. The amendment becomes effective in July of this year.

The New York State-wide dry enforcement bills were defeated. Bill No. 802 introduced by Mr. Donohue in the New York Assembly and Bill No. 632, introduced by J. F. Williams in the Senate, would permit new corporations to be organized and to engage in the practice of pharmacy.

Senate bill No. 300 and No. 728 of the House, Pennsylvania Legislature, mentioned last month, have been defeated. An insecticide measure has been amended and now seems to be acceptable to the drug trade.

Oregon Legislature amended the Oregon pharmacy law as follows: "Beginning July 1, 1925, all candidates for examination as registered pharmacists must be graduates of a college of pharmacy accredited by the Oregon Board of Pharmacy; provided, further, that the Board of Pharmacy may issue a certificate of registration to any person residing in this state who has had twenty (20) years' experience under the supervision of a registered pharmacist in a pharmacy where prescriptions of physicians are compounded, and who shall satisfy said Board of his or her competent qualification and skill as a pharmacist."

A test is being made in Martinsburg, W. Va., prohibiting the sale of soda fountain beverages on Sunday. The case being investigated is one in which a prescription for a soda fountain drink was written and dispensed.

BOARDS OF PHARMACY.

Secretary L. R. Tyson, of Wyoming Board of Pharmacy, is enlisting the interest of pharmacists to have the State appropriation for the Board of Pharmacy increased. Prompt action must be taken or the pharmacy law enforcement will be impeded during the next two years.

Governor Hammill appointed **George Judisch,** of Ames, to be a member of the pharmacy commission for three years, beginning July 1.

W. D. Clark, of Portsmouth, Va., whose term of five years as member of the Virginia State Board of Pharmacy expired on March 1, 1925, has been reappointed for another term of five years by Governor E. Lee Trinkle.

REORGANIZATION OF PROHIBITION ENFORCEMENT SYSTEM.

Reorganization of the system in the Treasury respecting control of the prohibition enforcement unit is being effected whereby the Assistant Secretary of the Treasury in charge of customs and internal revenue and the Commissioner of Internal Revenue are to exercise the real authority instead of the Prohibition Commissioner.

It is said that the action of the Treasury Department is a step in the direction contemplated in the Cramton bill, which failed during the last session of Congress.

BROAD POWERS OF COMMISSIONER OF INTERNAL REVENUE RELATING TO PERMITS TO USE ALCOHOL.

The United States Circuit Court of Appeals for the Third Circuit, in a decision handed down late in February, 1925, in the case of Ma-King Products Co. *vs.* David H. Blair, Commissioner of Internal Revenue, supports the contention long made by the National Wholesale Druggists' Association to the effect that the National Prohibition Act, with its provisions for investigation of applicants for permits, has endowed the Commissioner with sufficiently broad powers to take into account the character of individuals seeking permits. This power already vested in administrative officials of the Government renders unnecessary legislation such as that contemplated in the Cramton Bill and other measures of like character which have been advocated on the ground that the Commissioner lacked this power. The decision of the Court in this case is exceedingly important, inasmuch as it makes clear that the Commissioner is not obliged to grant a permit to any who may seek it. Evidence must be given indicating that the applicant is going to make proper use of the privileges granted by the permit. Where the character and associations of the individual applicants are such as to indicate a chance or possible intent to abuse privileges, it is the duty of the Commissioner to deny the permit.—*N. W. D. A. Bulletin, No. 96.*

GOVERNMENT LOSES DYE PATENTS APPEAL.

Agreeing at all points with the reasoning and the ruling of Judge Hugh M. Morris, of the United States District Court for Delaware, before whom the case was tried, the United States Court of Appeals for the Third Circuit has handed down a decision dismissing the appeal of the government from the adverse decision of the trial court in the action to invalidate the sale of some 6000 German chemical patents to the Chemical Foundation by the Alien Property Custodian. The Court of Appeals held, first, that the sale was made by the custodian within the powers conferred upon him by Congress, and that none of the allegations in

which the government sought to invalidate the transactions was proven by the evidence.

ALCOHOL URGED AS MEDICINE.

The value of alcohol for medicinal use was urged by Dr. Hobart A. Hare, professor of therapeutics at Jefferson Medical College, Philadelphia, in an address before the Congress of Internal Medicine last month. After enumerating the many medicinal properties of alcohol, Dr. Hare asked the assembly: "Does any drug do more for suffering humanity than this?" Though the American Medical Association went on record as opposed to the use of alcohol, Dr. Hare declared, that action was repudiated in a country-wide referendum conducted by the physicians themselves.

CANADA AND MEXICO APPROVE OF ANTI-NARCOTIC SMUGGLING PACT.

The Senate has ratified the treaty between Canada and the United States for the suppression of smuggling along the international border and assisting in the arrest and prosecution of persons violating the narcotic laws of either Government.

A treaty with Mexico will permit the Mexican Government to avoid legal delay when narcotic dealers are captured. Americans convicted of handling narcotics will get short shrift, being extradited without the usual reliance on lawyers' delay. Equal rigor will be applied to Mexicans who violate American laws. Whether jail sentences will be given before extradition has not yet been determined.

The Mexican Government has proposed a special clause to give wider scope and include smuggling of liquors.

ENTRAPMENT OF PHYSICIAN UNDER NARCOTIC LAW.

The United States Circuit Court of appeals Fourth Circuit—in the case of an accused physician for violation of Harrison Act, entrapped by a narcotic inspector—instructed the jury that while it is permissible for government agents and officials, through detectives and decoys, to entrap criminals, or to present opportunity to those having intent to or who are willing to commit crime, it is not proper for government officials, agents or decoys to incite to or create crime, for the purpose of prosecuting it or punishing it, and if the jury believe from the evidence that the government's agent and witness, through false statements made to the defendant to the effect that he was suffering from a disorder of the stomach and required morphine for the purpose of relieving the pain incident thereto, or that he was an addict or had been an addict, and found it necessary occasionally to take small doses in an attempt to cure himself from the drug habit, and through such statements, which were false, procured from the defendant the morphine for the dispensing of which the defendant stands indicted, and the defendant, believing the statements made by the inspector were true, was induced thus to violate the law and that said defendant was not theretofore willing thus to violate the law, and would not otherwise have violated the law, then the jury should find the defendant not guilty.

BOOK NOTICES AND REVIEWS.

De Danske Apotekers Historie. By E. Dam and A. Schaeffer. Vol. I. Part 1. 80 pp. Lex. Levin & Munsgaards Forlag, Kobenhavn.

It is a pleasure to note that the much neglected study "History of Pharmacy" is receiving more attention of late years. Now comes to us the first part of a new book "The History of Danish Pharmacists." What a fascination there is in tracing the history of ancient pharmacies from their origin and foundation through centuries and generations up to the present time! The authors are to be congratulated for undertaking this task. The work when completed will contain the history of every pharmacy in Denmark and Iceland up to the year 1922 together with biographies of each owner. Vol. I is devoted to those in existence before 1672 and Part I, before us, describes phramacies and pharmacists in chronological order up to that time, together with chapters on the history of pharmacy during the 15th, 16th and 17th century.

The oldest pharmacy in Denmark, still in existence, is the "Love-Apotheket," *i. e.*, "Lion Pharmacy" in Odense, which received its charter from King Christian III on April 25, 1549. Since that day, beginning with Apoteker Cornelius Hamsfort, up to the present time with Apoteker Peter Johansen de Neergaard, this ancient apothecary shop has only had 18 proprietors.

This book gives a highly interesting insight into the life and activities of successive generations of Danish Apoteker and presents the

honorable record for about 400 years of Danish pharmacies and pharmacy. It is a document of which history of pharmacy can be justly proud.

Fachwoerterbuch fuer den Chemikalienhandel. Deutsch-English-Französisch-Spanisch. Bearbeitet von Dipl.—Ing. Erwin Hellbusch. Octavo 403 pp. Cloth, 10 Goldmark. R. Bredow Verlag, Berlin W. 57.

A chemical dictionary in 4 languages—German, English, French and Spanish—has been sadly needed for some time. The clever German author and the enterprising German publisher have fulfilled this want in the book before us.

The dictionary proper is divided into 4 parts: I, German-English-French-Spanish comprises 87 pages of 4 columns each. II, English-German consists of 100 pages; III, French-German 96 pages, and IV, Spanish-German 101 pages, each page containing double columns. An additional, Part V, contains abbreviations and correspondence in English, French and Spanish and besides a compilation of weights, measures and money in use in the different countries throughout the world.

The work is a true proof of the proverbial German thoroughness, as it contains not only chemicals, chemical products, chemical and technical methods and apparatus, but also drugs of the vegetable and animal kingdom, pharmaceutical preparations, oils, colors and pharmaceutical methods and apparatus. The author missed nothing and made the book as complete as possible.

It is a handy and handsome reference volume which should become better known in America among chemical manufacturers and chemists and among wholesale and retail druggists and pharmacists.

A Textbook of Pharmacology and Therapeutics. By E. Poulsson, Professor of Pharmacology in the University of Christiania. English Edition edited by W. E. Dixon, M.A., M.D., F.R.S., Reader in Pharmacology and Assessor to Regius Professor of Physics, Cambridge. First American Edition. Octavo 519 pp. Cloth, $6—Baltimore, Williams and Wilkins Company.

Schmiedeberg's classical work "Grundriss des Pharmakologie" is one of the master works. Based thereon Prof. Poulsson the eminent Norwegian pharmacologist wrote his book which became a standard throughout Scandinavian and Teutonic countries. An English translation of this work by another authority is a welcome addition to the literature, and the first American edition by the enterprising Baltimore firm should be gratefully received.

The science of pharmacology and the art of therapeutics have made great strides, especially in recent years. In the book before us the author laid special stress on the relationship of pharmacology to applied therapeutics. He brought together into one volume the most important parts as can be seen from the headings of the six sections: Organic Remedies acting after Absorption, Those Acting Locally; Salts of Alkalies, Acids, Halogens, etc.; Heavy Metals; Ferments and Foodstuffs; Antitoxins and Bacterial Products.

The descriptions of the various drugs are necessarily concise but sufficiently clear and complete. The Latin and English titles of both the British and U. S. P. of drugs and their preparations are given, and the doses in both metric and apothecaries' systems. Many unofficial drugs, chemicals and galenicals are also included, when found to be of value. On p. 89 under Opium Alkaloids there are added Benzylmorphinae, Papaverinae, Pantoponum and Narcophinum, together with description, action, uses and dose. The chapters on cocaine, opium, antipyretics, purine derivatives, alcohol and purgatives are exceptionally well written. The paragraph on methyl alcohol and its poisonous effect should be read and studied by all interested. The discussion of some of the newer drugs and new uses of older drugs is up-to-date and throughout the book the author has taken great pains to bring the work into line with modern thought. It is a great book, by a great man on a great subject. The work is of great value not only to the pharmacologist but also to the physician, the pharmacist and the student.

OTTO RAUBENHEIMER, PH.M.

The Book of Receipts. By E. W. Lucas and H. B. Stevens. P. Blakiston's Son & Co., Philadelphia. 473 pages. Price $4.00.

The authors have been active for a number of years in the advancement of pharmacy and chemistry in Great Britain. The first-mentioned is a fellow of the Institute of Chemistry and of the Chemical Society, a pharmaceutical chemist, late member of the British Pharmacopœia Reference Committee, late examiner of the Pharmaceutical Society. The Associate was lecturer on Pharmacy and Food and Drugs in the Southwestern Polytechnic Institute (England).

The fact that this is the 12th edition of this well and favorably known work, speaks for

its value to pharmacists. While prepared for British pharmacists, the greater number of the formulas given will find application in American drug stores. The veterinary section has been amplified and contains prescriptions illustrating the employment of drugs in general use for the treatment of the more common ailments of animals. Other formulas are types as well as definite compositions of proprietary articles, toilet preparations, dietetic articles, household specialties, etc. Practical methods are given, together with formulas, for the examination of urine, milk, potable waters, sputum, etc.

Evidently the veterinary practice is of importance in Great Britain for Part I deals with diagnosis, treatment and formulas, and covers more than 70 pages. The Domestic Formulary comes next, with nearly as many pages, and as great a variety of formulas, beginning with beverages and food stuffs and concluding with —how to whiten tennis balls, examination of writings of forgeries, and restoration of faded writing. The formulas indicate careful selection and adjustment Photographic formulas comprise Part III, and herein the formulas of dealers in photographic chemicals are given in addition to other formulas and methods in general use. Pharmaceutical formulas comprise Part IV, followed by the sections of toilet preparations, and of perfumes. It is rather difficult to review a book of formulas, but basing comment on the successive revisions, the selection and the formulas with which we are acquainted, the book is deserving of favorable commendation and recommendation to pharmacists. It should be observed that the Imperial system of weights and measures is used and quantities must accordingly be calculated. The system is not exclusively employed however, and that is offered as a criticism—on page 215, for example, quantities are given in metric, Imperial denominations and by parts in three formulas, one following the other. Also, such quantities as one-fourth of a drop, one-half drop are given—there might be a reason if in the group of formulas the same quantities were designated, but this is not the case; therefore, it would have been better to figure the finished product so that a drop or a minim, or better still, measurable minims had been designated. Every formulary carries such imperfections, because the original formula is followed.

Many useful tables are appended. The book reflects credit on the compilers and publishers.

Chemistry in Industry: a coöperative work intended to give examples of the contributions made to industry by chemistry. Edited by H. E. Howe, chairman of American Chemical Society Committee on Prize Essays; editor, *Industrial and Engineering Chemistry*. 12 mo. 372 pages, cloth. New York, The Chemical Foundation, Inc.

This book has been published in response to the demand for such a work; monographs, prepared by twenty-two leading industrial chemists of this country, have been collected in one volume by H. E. Howe, Editor of *Industrial and Engineering Chemistry*, and published by the Chemical Foundation, Incorporated, of New York City. It presents a symposium to which these co-workers have contributed, and it is written in language that holds the reader's attention and develops his interest in the subjects.

The scope of the field covered is shown in the following chapter headings: I, The foundations of chemical industry, by Robert E. Rose; II, Abrasives, by F. J. Tone; III, Alcohol and Other Solvents, by D. B. Keyes; IV, Coal, Coke, and Their Products, by F. W. Sperr, Jr.; V. Cotton and Cotton Products, by Thomas C. Law; VI, Chemistry in the Electrical Industry, by Buckner Speed; VII, Some Applications of Electrochemistry, by A. H. Hooker; VIII, Chemistry in the Fertilizer Industry, by R. B. Deemer; IX, Industrial Gases, by Clark S. Robinson; X, Glass, One of Man's Blessings, by Alexander Silverman; XI, The Elements of Iron and Steel Manufacture, by A. E. White; XII, The Making of Leather, by John Arthur Wilson; XIII, Non-ferrous Metallurgy, by H. W. Gillett; XIV, Chemistry of Packing House Processes, by W. D. Richardson; XV, Chemistry in the Pulp and Paper Industry; by Maximilian A. Krimmel; XVI, Perfumes and Flavors, by S. Isermann; XVII, The Petroleum Industry, by Gerald L. Wendt; XVIII, Photography, Or Picture Making By Light, by S. E. Sheppard; XIX, Synthetic Resin; a Chemical Contribution to Structural Materials, by A. V. H. Mory; XX, Chemistry in the Rubber Industry, by W. J. Kelly; XXI, Chemistry in the Textile Industry, by L. A. Olney.

The book may be obtained at one dollar per volume, which represents its cost, from American Chemical Society, Committee on Prize Essays, 85 Beaver St., New York.